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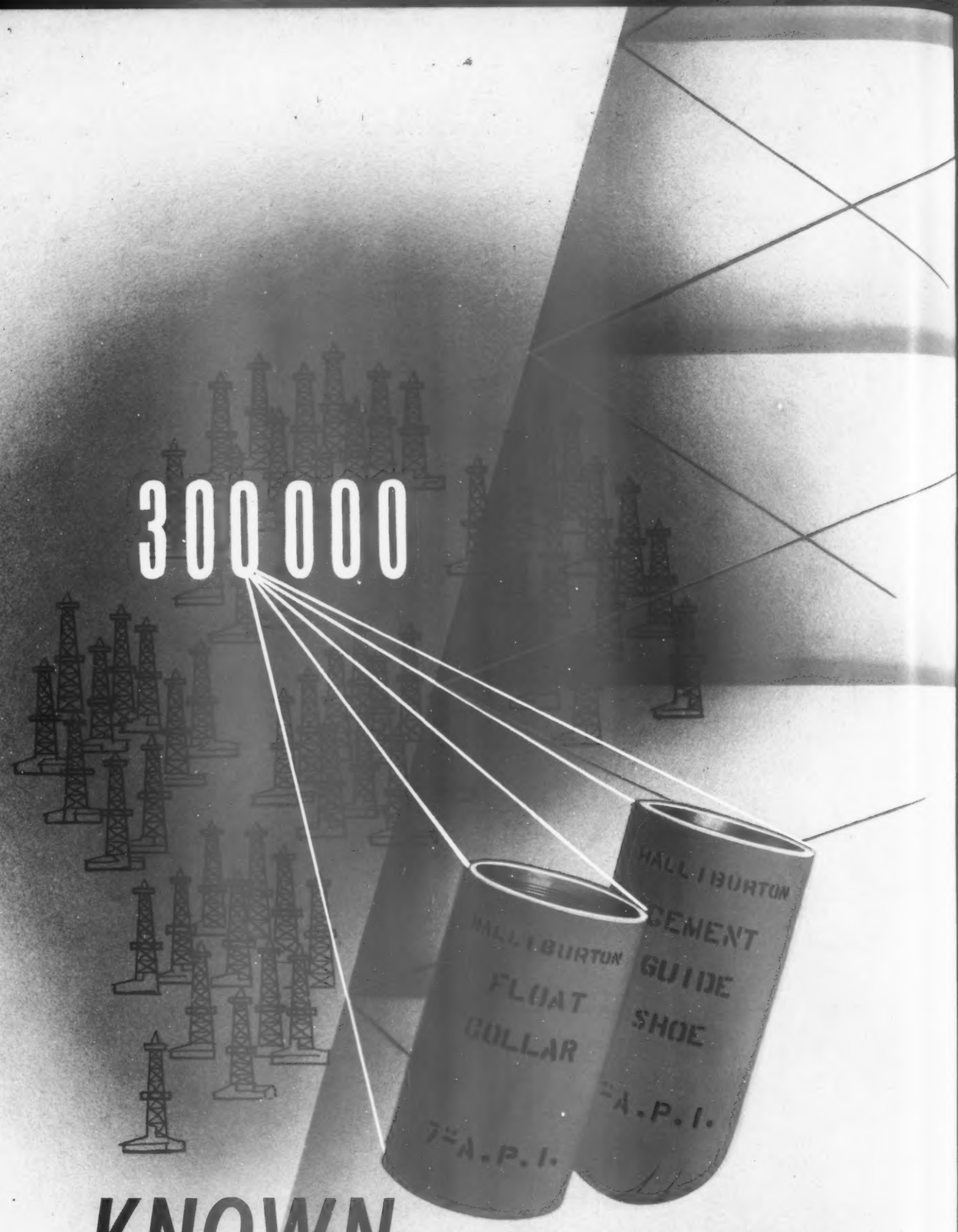


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*They Say...*

# THE REWARD OF ACHIEVEMENT IS RECOGNITION

**. . . and if this is true we have been bountifully rewarded through the recognition of the BAKER MODEL "K" CEMENT RETAINER by the Oil Industry.**

**Like most rewards, Recognition must be earned, and this original device is the result of 30 years of research and development by Baker engineers. So original is the Baker CEMENT RETAINER that even its name was "coined" to express its function of placing cement and fluids in oil wells under high pressures, at the time desired and at the proper point to accomplish the desired results. Old timers will remember that this operation was considered practically impossible prior to the introduction of the Baker Cement Retainer, but today—after constant improvement and first-hand knowledge and field experience gained through thousands of runs—the remarkable results obtained by using the 1941 version of the Baker Cement Retainer are accepted as a matter of course.**

**These are the most important facts to be remembered concerning the Baker Model "K" Cement Retainer: The correctness of its design and construction has been field tested in thousands of wells ● It is dependable ● Its construction is simple ● It is easy to operate ● It will withstand extremely high pressures (greater pressures than can be imposed safely upon the casing in which it is recommended to be set) ● It can be used for more than a dozen important field operations involving cementing, well repair and well completion work.**

***If you do not have full knowledge of the design and operation of this successful device—if you do not appreciate its many applications—we urge you to study the Baker Section in the 1941 Composite Catalog; to send for an individual Baker Catalog; or have the nearest Baker representative give you complete and convincing details.***

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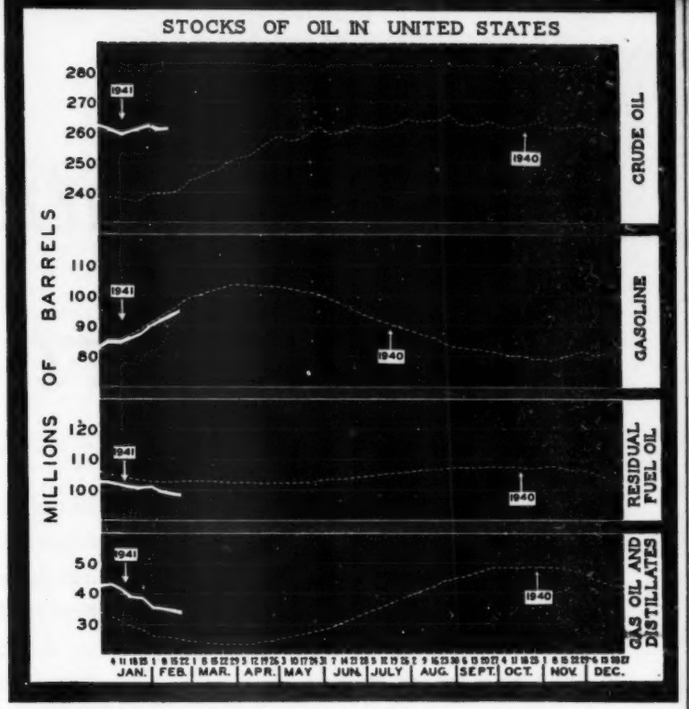
# Trends

## Need for Restraint Emphasized as Basic Conditions Improve




TENDENCY of the industry to place overly optimistic interpretations on slight improvements in basic conditions again is in evidence. Active solicitation of new crude-oil connections, a quarter-cent advance on most grades of gasoline at coastal refineries and forecast of an 8 per cent increase in motor-fuel demand next month over last March are the most tangible of basic improvements. Some elements in the industry, observers say, are apparently assigning importance to recent developments out of proportion to their relationship with the whole.

CRUDE PRODUCTION *3,627,665 bbl. daily average—up 16,600 bbl. One year ago 3,738,043 bbl.*

CRUDE STOCKS *260,948,000 bbl. as of February 15—up 698,000 bbl. One year ago 239,838,000 bbl.*

GASOLINE STOCKS *95,812,000 bbl. as of February 22 — up 1,071,000 bbl. One year ago 97,512,000 bbl.*

RESIDUAL FUEL-OIL STOCKS *98,631,000 bbl. as of February 22 — down 794,000 bbl. One year ago 103,079,000 bbl.*

GAS OIL AND DISTILLATES *34,381,000 bbl. as of February 22—down 1,377,000 bbl. One year ago 25,030,000 bbl.*

REFINERY RUNS *3,590,000 bbl. daily week ended February 22 — down 40,000 bbl. One year ago 3,490,000 bbl.*

Louisiana has set its March crude-oil production allowable at 306,190 bbl. daily, 14,890 bbl. above the Bureau of Mines estimate of demand. Purchasing companies have nominated 1,684,694 bbl. daily in Texas which is 357,294 bbl. higher than the bureau's calculation of March demand.

One point stands out from the Texas Railroad Commission hearing at which March nominations were submitted. Emphasis of purchasers for additional oil was placed on crudes yielding relatively high percentages of lubricating distillates. This trend appears to have long-range significance. An increase in demand for lubricants caused by expansion of industrial activity usually precedes a comparable bulge in consumption of other petroleum products by 45 to 60 days.

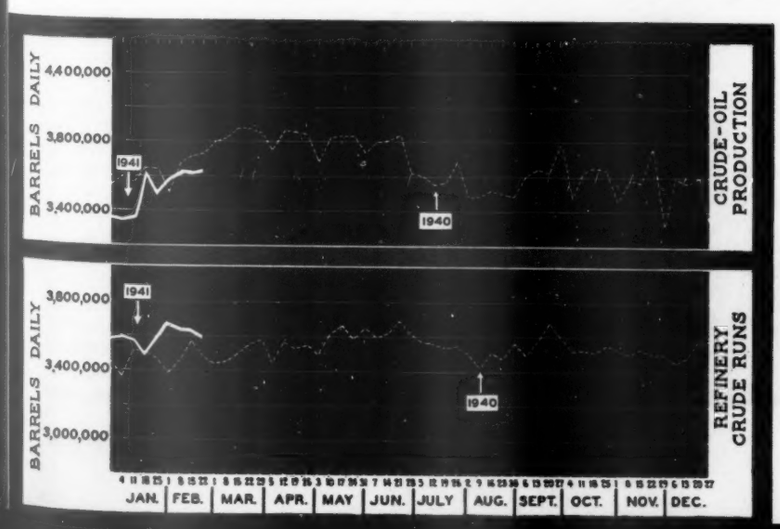
Unrealities of the current situation include the probability that eastern jobbers are taking advantage of the current sag in tanker rates accepting delivery on products in excess of immediate needs. Consequently, the expansion of cargo-gasoline business on the Gulf Coast may be out of proportion to consumptive requirements. Then, too, Washington is using moral suasion to increase stocks on the eastern seaboard as insurance on emergency demands.

### *DAILY AVERAGE PRODUCTION FOR WEEK*

| | Feb. 22, 1941 | Bur. Mines Feb. est of demand | February state allowables | Feb. 15, 1941 |
|---|---|---|---|---|
| Arkansas | 69,740 | 66,100 | 69,969 | 70,160 |
| California | 605,250 | 595,700 | 571,000 | 629,250 |
| Eastern fields | 112,200 | 121,800 | ..... | 111,000 |
| Illinois | 320,400 | 342,100 | ..... | 322,490 |
| Kansas | 207,100 | 193,200 | 197,000 | 177,500 |
| Louisiana | 292,900 | 288,600 | 294,942 | 294,955 |
| *North Louisiana* | *70,525* | ..... | ..... | *69,655* |
| *Louisiana Gulf Coast* | *222,375* | ..... | ..... | *225,300* |
| Michigan | 39,415 | 47,500 | ..... | 39,335 |
| Mississippi | 21,005 | 16,100 | ..... | 17,920 |
| Nebraska | 3,400 | 3,200 | ..... | 3,200 |
| New Mexico | 105,820 | 100,700 | 106,000 | 105,790 |
| Oklahoma | 406,700 | 442,500 | 400,000 | 407,620 |
| Rocky Mountain states | 93,285 | 98,500 | ..... | 93,395 |
| Texas | 1,350,450 | 1,312,900 | 1,318,873 | 1,337,150 |
| *East Texas* | *374,525* | ..... | ..... | *374,475* |
| *West Texas* | *235,425* | ..... | ..... | *234,875* |
| *North Central Texas* | *131,250* | ..... | ..... | *131,100* |
| *East Central Texas* | *72,575* | ..... | ..... | *71,725* |
| *Texas Panhandle* | *75,575* | ..... | ..... | *67,000* |
| *Texas Gulf Coast* | *368,850* | ..... | ..... | *365,750* |
| *Southwest Texas* | *92,250* | ..... | ..... | *92,225* |
| Total United States | 3,627,665 | 3,628,900 | ..... | 3,611,065 |
| Total production Jan. 1-Feb. 22, 1941 | | 187,995,505 bbl. | | |
| Same period last year | | 193,351,407 bbl. | | |

Offsetting improvement in gasoline markets is a compensating weakness in distillate fuel oils. Kerosene and the entire range of light burning oils are basically soft. Reductions of 0.2 cent per gallon in kerosene, range oil and No. 2 fuel were made last week at several eastern seaboard points following similar declines late in January. The stimulant of cold weather in the northern and eastern states on the light fuel-oil market is considered temporary at best.

Suggested operations for March will bring the industry's stocks of motor fuel up to approximately 100,000,000 bbl. on April 1. The bureau's forecast provides for addition of 2,600,000 bbl. of finished gasoline to stocks next month compared to an increase of 3,746,000 bbl. a year ago. Provision for diverting 1,146,000 bbl. of gasoline to current demand that went to storage last year emphasizes the importance of conservative refinery operations.



# *Illinois Anticipates Big Year Despite Production Decline*

By HARRY F. SIMONS

**Illinois is starting 1941 on a much firmer basis than 1940. The market demand is ahead of production and there is no prolific pay in the offing to force a drilling orgy. Discoveries are maintaining production at a fairly steady level and the improved-price situation is encouraging the continued search for new fields.**

MOUNT CARMEL, Ill., Feb. 25.—Illinois, faced with declining production, is again looking forward to a year of active exploitation with particular emphasis being placed on the south and southeastern portion of the state. Daily production for January 1941 was almost 50,000 bbl., or 13.8 per cent, under the same month a year ago while drilling activity is at present approximately 29.5 per cent under last year. However, more wells were actually completed in Illinois during January 1941 than in the first mohth of 1940.

Principal reason for the difference in activity is the lack of any large field undergoing development. Last year, the lid had just been kicked off of the Devonian in the Salem field and there was a rush to penetrate that horizon. This year, the Trenton in the Salem field has just been found productive but the size of the wells and the cost of development are making the operators wary. Taking the place of a single large field are a number of small ones which were discovered during the past year and which are being actively developed. In addition there are town-lot booms getting under way in Benton, in Franklin County, and Mount Carmel, in Wabash County. Already there are a number of rigs running within the city limits of Mount Carmel and if the wells are of any value a fast campaign may be expected.

*Left: Rigging up rotary preparatory to drilling well in the city limits of Mount Carmel, Ill. Below: looking down highway at city limits of Mount Carmel. This is the largest municipality to be invaded by derricks since Centralia*

### Production Curve Flattens

The trend in production is shown in Fig. 1, a steady decline from June 1940 to the present being shown. There is a tendency for the curve to flatten during the past few months although there is currently no indication that it will start back upward. Most operators in the state are expecting a decline in total output of from 1 to 5 per cent per month. While drilling operations will account for 150 to 200 new producing wells per month, the new production obtained will only partially offset the decline in the wells already completed. Total oil output from the state at the end of another year will be somewhere in the neighborhood of 260,000 bbl., according to observers who have watched Illinois production rise and fall.

The decline in production is forcing not only changes in the revenue of the companies interested in the Illinois oil picture but it is also causing radical changes in the marketing of this crude. Table 1 shows the results of a year's development as far as the producing companies are concerned. Major increases in output can be credited to the Carter Oil Co., Continental Oil Co., Exchange (Sinclair) Oil Co., Gulf Refining Co., Pure Oil Co., Sun Oil Co., Superior Oil Co. and Tide Water Associated Oil Co. The Louden field has been the principal scene of operation for the Carter company while Gulf got most of its increase from the development of the Centralia field, and Pure found some prolific McClosky production in Jasper County. The other companies have for the most part obtained their production in the southeastern part of the state.

**TABLE 1—COMPARATIVE DAILY AVERAGE PRODUCTION BY COMPANIES, JAN. 1, 1941, AND JAN. 1, 1940**

| | 1941 | | 1940 | |
|---|---|---|---|---|
| Company— | Wells | Dly. av. | Wells | Dly. av. |
| Adams | 142 | 3,345 | 126 | 1,750 |
| Carter | 1,129 | 50,173 | 887 | 44,804 |
| Continental | 36 | 1,392 | 15 | 393 |
| Deep Rock | 1 | 12 | 1 | 6 |
| Exchange | 62 | 4,019 | 13 | 276 |
| Gulf | 116 | 6,236 | 58 | 1,634 |
| Kingwood | 103 | 3,976 | 69 | 17,929 |
| Magnolia | 494 | 19,798 | 331 | 45,869 |
| McBride | 79 | 2,631 | 59 | 13,256 |
| Ohio | 216 | 8,850 | 140 | 10,747 |
| Phillips | 9 | 697 | 8 | 200 |
| Pure | 833 | 35,767 | 581 | 31,124 |
| Shell | 302 | 10,268 | 215 | 15,122 |
| Skelly | 14 | 296 | 5 | 144 |
| Sun | 28 | 1,733 | ..... | ..... |
| Superior | 82 | 7,476 | 3 | 40 |
| Texas | 1,722 | 93,380 | 1,076 | 111,129 |
| Tide Water | 45 | 2,044 | 15 | 758 |
| Others | 2,119 | 65,044 | 1,456 | 65,194 |
| Total | 7,532 | 317,137 | 5,058 | 360,375 |

Companies which showed a sharp decline in production include Kingwood Oil Co., Magnolia Petroleum Co., W. C. McBride, Inc., Ohio Oil Co., Shell Oil Co., Inc., and the Texas Co. These companies control the bulk of production in the Salem field in Marion County and its decline is responsible for their showing decreased output. The small independent companies obtained enough new production to offset the lower output of the older wells.

It is interesting to note that it required 663 new oil wells during the year to hold the production figure to 65,000 bbl. daily. On the same basis it requires the drilling of 3,300 producing wells annually to hold the state's output at its present level. Last year, the peak in Illinois drilling saw only 3,080 producing wells completed in the state, according to the state Geological Survey. As fewer wells will probably be com-

pleted this year than last, it is plain that the new work in sight cannot possibly offset the decline in production.

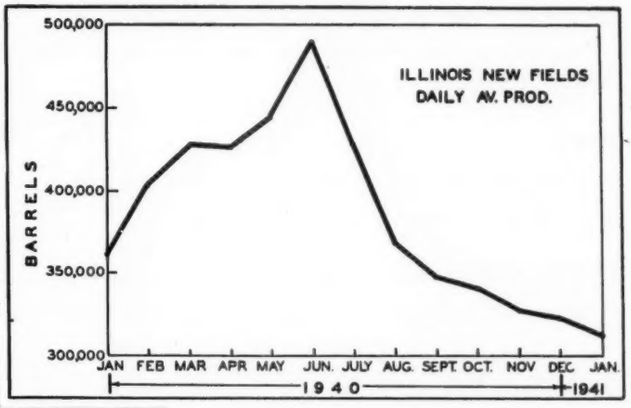
At the present time the state is being produced at approximately 75 per cent of its capacity, and it will probably keep on at this rate for some time. The only place where production could be increased is in the Louden field in Fayette County. Carter Oil Co. from the start of the development of that pool has voluntarily restricted its production and has received the cooperation of some other companies in the field. It also has an extensive repressuring program in operation.

### Many Pipe-Line Changes

Shifting of the center of development has caused many changes in the marketing of Illinois crude. This is shown in Table 2. Most of the purchasing companies which show declines were obtaining their supply from the Salem field. Some of these were only handling their own oil temporarily while the market was being flooded with flush oil; they are not normally purchasing companies.

In recent months several important changes have taken place with new companies coming into the field and building lines. These include the Superior Oil Co., with a line from Ribeyere Island to Mount Vernon, Ind.; British American Oil Co., with a line from Griffin, Ind., to Albion, Ill.; Illinois Pipe Line Co., with a line from Enfield to its main system, and the Wabash Pipe Line Co. (Pure) with a line from Calvin to Centerville. The Sohio Pipe Line Co. has repeatedly extended its system to take care of new fields and is preparing now to lay a line to serve the town-lot development in the Mount Carmel area. The total pipe-line capacity of the state is approximately 550,000 bbl.

The small refineries in the state, mostly skimming plants, are out of the picture as they cannot compete with the pipe lines in purchasing the crude. The plants still operating have cracking units and some out-of-state oil is being shipped in to satisfy the requirements of some of these refineries.




*Right: Daily average production by months in Illinois from January 1940 to February 1, 1941. Below: Running electrical log on test in townsite of Mount Carmel, Ill.*

**TABLE 2—COMPARATIVE PIPE-LINE RUNS FOR ILLINOIS, JAN. 1, 1941, AND JAN. 1, 1940**

| Company— | 1941 Wells | 1941 Dly. av. | 1940 Wells | 1940 Dly. av. |
|---|---|---|---|---|
| Aetna Refining Co. | 67 | 1,797 | ..... | 495 |
| Allied P. L., St. Elmo | 48 | 1,924 | 31 | 1,992 |
| Allied P.L., Nat. Ref., Findlay, Ohio | 16 | 5,422 | 20 | 9,408 |
| Ashland Ref. Co. | .... | ..... | ..... | 1,132 |
| Canyon P. L. | 32 | 423 | 110 | 6,225 |
| Cascade | .... | ..... | 2 | 54 |
| Centralia Ref. | .... | ..... | 3 | 174 |
| Central P. L. | 364 | 7,349 | 143 | 12,767 |
| Central-Illinois Ref. | .... | ..... | ..... | 555 |
| Hal Compton | 220 | 12,576 | 35 | 1,804 |
| Evansville Ref. | .... | ..... | .... | 102 |
| Gulf | 54 | 2,491 | .... | .... |
| Head | .... | ..... | ..... | 34 |
| Illinois P. L. | 91 | 2,144 | 70 | 1,025 |
| Kingwood Oil | .... | ..... | 16 | 1,693 |
| Louden P. L. | 42 | 1,168 | 47 | 3,488 |
| Magnolia P. L. | 477 | 15,670 | 346 | 44,432 |
| Manly P. L. | 8 | 468 | 26 | 1,294 |
| McBride, Inc. | .... | ..... | 23 | 7,406 |
| Marimac | 66 | 1,648 | .... | 939 |
| Oklahoma P. L. | 1,073 | 47,714 | 844 | 43,167 |
| Potter Bros. | 34 | 445 | 37 | 1,736 |
| Pure C. O. P. | 810 | 34,047 | 578 | 31,033 |
| Rischer | 2 | 76 | 7 | 160 |
| Shell | 77 | 3,539 | 80 | 2,651 |
| Sohio | 2,049 | 63,219 | 1,668 | 53,909 |
| Stoll Ref. | 17 | 392 | 8 | 260 |
| Superior | 78 | 7,439 | ..... | ..... |
| Texas | 1,585 | 85,398 | 1,132 | 112,073 |
| Sun | 41 | 2,599 | ..... | ..... |
| Union | 31 | 366 | 20 | 1,392 |
| Western P. L. | 415 | 18,823 | 246 | 18,975 |
| Total | 7,697 | 317,137 | 5,492 | 360,375 |

### Field Development

The winter has been unusually mild and has been very favorable for continued drilling operations. This is in sharp contrast to previous years when the soft ground caused serious difficulties in moving material into the location. Indications are that the spring thawing and rainy season will be short.

Over 50 per cent of the field development is in the southeastern part of the state, Wabash, Edwards, White, Franklin, Hamilton and Gallatin counties. As of February 12, 1941, there were 329 active operations in the state with 225 drilling, 43 inactive, 29 rigs and 32 locations. Of the 84 wildcat operations in the state 38 were drilling, 25 were inactive and the remainder were locations and rigs. Indiana had 89 drilling operations exclusive of reconditioning jobs with 43 of them wildcats. The Griffin field in Indiana accounted for 15 of the active operations.

Biggest question mark at the time is the Trenton in the Salem field. While the second completion in that horizon was better than the discovery well, it still was none too cheering. There is a serious doubt in many minds as to whether the amount of recoverable oil will justify drilling any new wells to this horizon. So far all of the Trenton tests started have been deepening jobs with 19 now in operation. The work is done with cable tools with from 50 to 70 days being required to drill the section below the Devonian and complete the wells. There is a strong possibility that the St. Peter in the field is dry, and that the Trenton development will be the last roundup for the Salem pool.

### Louden Pool

The Louden pool is practically completely developed in known producing horizons with about 50 edge locations to be drilled. There is still no inkling as to what was found by Carter Oil Co. in its stratigraphic test in that field. Some observers are pessimistic while others are hopeful that the big Fayette County pool will not only produce from the Devonian but will also find good production in the Trenton lime.

Of the new fields being developed the most outstanding is the Hoodville pool in Hamilton County where there are 26 operations at the present time. The production is obtained from both the Benoist and the Aux Vases sands with both horizons being fairly continuous. Size of the wells varies up to more than 400 bbl. per day initial. It is almost entirely a major company play.

Mount Carmel has 20 active operations with production being obtained from several zones. The number of operations is naturally increased by the close spacing. The Calvin field in White County continues to grow and at the present time there are 34 active operations in the area with oil being sought in every formation in the Chester sands, the McClosky lime and some of the Pennsylvanian sands. New Harmony is also active with 10 drilling tests and here again is a case of multiple-zone production. The Storms pool in White County is still being expanded with six tests drilling in the field at the present time.

A potential town-lot play adds to the interest in Franklin County where the Benton pool was recently opened. There are four wells drilling and one location in the field at this time. The field is defined ½ mile on the east, ¾ mile on the north and ½ mile on the northwest. It may go south and include the Benton townsite but a dry hole on the east side cuts down the possibility of a big play in the village limits.

There are several wildcats which show promise of production and several new fields have been opened since the first of the year. Added to the extensions this makes a considerable backlog of work for the next 11 months. In addition, the major companies are planning on testing most of the remaining known structures. The Illinois basin is in for another very active year.

# SPARKS . . . FROM THE NEWS

**DANGER—WELLS AT WORK:** The proposed Oologah flood-control dam near Will Rogers' old home threatens to flood out the water-flood oil producers at Nowata during periods of high water. A case of flooding out the flooders.

**FIRST:** This month Cleveland, Ohio, becomes the first large city to have peak demands in cold weather provided for by natural gas from stored supplies of liquefied gas.

**RETURN TO THE OLD:** Drilling activity in Southeast New Mexico is shifting to areas first opened to oil production in that part of the state—the Artesia-Grayburg-Maljamar area on the Lea-Eddy county line.

**NEBRASKA STIRS:** Scouts are moving into southwestern Nebraska, the second Saline basin wildcat is started and it looks like the much-touted Nebraska play is upon us. Leasing and preliminary exploration has been under way for 4 months.

**NOR RAIN, NOR SNOW:** Rain, snow and bottomless mud have piled delays on wildcat operations in the Mid-Continent, but to date have caused few shutdowns even in the most remote regions. Activity is higher than a year ago.

**EXTREMES:** Crews on a Michigan well had to use blow-torches to melt ice in the surface connections. The same week the drill pipe in a Gulf Coast well became stuck due to heat causing premature setting of the cement.

**MORE AHEAD:** Refiners in all areas are recognizing now more than ever before the feasibility of operating gasoline pipe lines out of the important manufacturing centers into consuming centers. Their value in national defense is a contributing factor.

**INVOLVED REASONING:** Because regulation by federal bureaus has greatly restricted production in Wyoming, that state's senate has just refused to enter the interstate oil compact which is designed to limit federal control.

**TIME DEPOSIT:** An oil company has offered to lend a West Texas county $40,000 at 2 per cent interest to help build a park. Some crank is apt to claim the offer was made for a selfish purpose of developing young engineers.

**LEAPED BEFORE LOOKING:** An investor finds that he bought a mineral interest giving him 6.83 bbl. out of each 1,000,000 produced from 715 acres, a fraction of 1/146,432. No wonder Canada has prohibited divisions of less than 1/40.

**NO CELEBRATION:** Kilgore, Tex., disregarded its tenth birthday anniversary last week. While the city claims that it has more oil wells within its limits than any other municipality in the world, it is too busy drilling new wells to take time out for a birthday party or proclaim a holiday.

**PROFIT TAKING:** A distillate crude is being produced and sold from Michigan's deep test while crews are attempting to recover stuck pipe. The well is not even near completion but operators aren't wasting any time in getting back some of the cost of drilling.

## TEXAS-STYLE GOAL POST . . .

*Looking through entrance gate of athletic field at Nocona, Tex., at a pumping well in the Rogers & Rogers field. This gridiron warrior knows no season, and needs no blockers to run interference*

**BY THEIR SPOTS:** The vociferous opposition which swamped the Atkinson oil-conservation bill in California is again campaigning. This time against the oil compact.

**PLAYING SAFE:** Sound judgment dictates the policy of new refineries being located in the Illinois basin but near enough to existing pipeline facilities and with an understanding that the refineries will be able to get Mid-Continent crude.

# Gigantic Tanker-Construction Program Now Under Way

By J. P. O'DONNELL

NEW YORK, Feb. 25.—The largest tanker-construction program for this country in 20 years is currently under way in United States shipyards and 1941 will witness the delivery of the largest number of tankers and the greatest volume of tonnage since 1921. Present indications are that 27 tankers will be delivered this year, almost half as many as were completed in all preceding years of the decade ending with 1941.

Latest reports show that there are altogether 69 tankers building or under contract in United States shipyards. In addition to the 27 expected to be delivered this year, 26 are expected to be completed in 1942, 14 in 1943, and 2 in 1944. During 1941 it is expected that 4 tankers will be delivered in the first quarter, 4 in the second, 9 in the third, and 10 in the fourth.

One of the tankers scheduled for 1941 completion has already been delivered. This is the Esso "Little Rock," which was launched at the Chester, Pa., shipyard of the Sun Ship Building & Dry Dock Co., January 7. This is a sister ship of previously launched Esso "Augusta," of 18,000 deadweight tons. They are motor-propelled vessels of 7,500 hp. and have a rated speed of 15 knots.

The completion of the program during which 12 high-speed, large-capacity tankers were built by the Standard Oil Co. of New Jersey for the optional use of the U. S. Navy means that the average tonnage of tankers to be completed this year will be less than in either of the immediately preceding years. In 1940 and 1939 the average deadweight tonnage of tankers completed then was 15,700 tons and 16,000 tons, respectively, whereas the 1941 average will be closer to 14,000 tons. Despite this reduction the average will still be much greater than in the 1918-21 period when United States tanker construction was at its peak. In addition to greater capacity, greater speeds are also provided in the modern vessels so that one of the new ships is approximately equal to two of the older vessels.

### Orders Cover 69 Boats

Summarized by ownership, the number of tankers either under construction or contracted for in United States shipyards as of February 1 follows:

| | |
|---|---|
| Standard Oil (N. J.) | 16 |
| Socony-Vacuum* | 9 |
| Sinclair Refining | 10 |
| Texas Co. | 3 |
| Natl. Bulk Carriers | 4 |
| Union Oil Co. | 3 |
| Atlantic Refining | 4 |
| Gulf Oil Corp. | 4 |
| Sun Oil Co. | 2 |
| Keystone Tankship | 8 |
| Standard Oil (Calif.) | 2 |
| Richfield | 1 |
| Pan American | 1 |
| Continental Oil | 1 |
| Cargill, Inc. | 1 |
| Total | 69 |

*And subsidiaries.

A summary of the shipyards at which these tankers are being or will be built is given below. There has been some indication that future tanker construction will be concentrated more than in the past. This plan may be undertaken to facilitate tanker construction and to free yards for the building of other types of cargo ships. Since more than half of the tankers listed above are being built at the Sun Ship Building & Dry Dock Co. yards, it may be assumed that if tanker construction is to be limited to one yard it will be carried on at Chester.

| | |
|---|---|
| Sun S. D. & D. D. Co. | 35 |
| Bethlehem, Sparrows Point | 15 |
| Bethlehem, Fore River | 9 |
| Federal S. B. | 5 |
| Alabama S. B. | 2 |
| Welding Shipyards | 2 |
| Cargill, Inc. | 1 |
| Total | 69 |

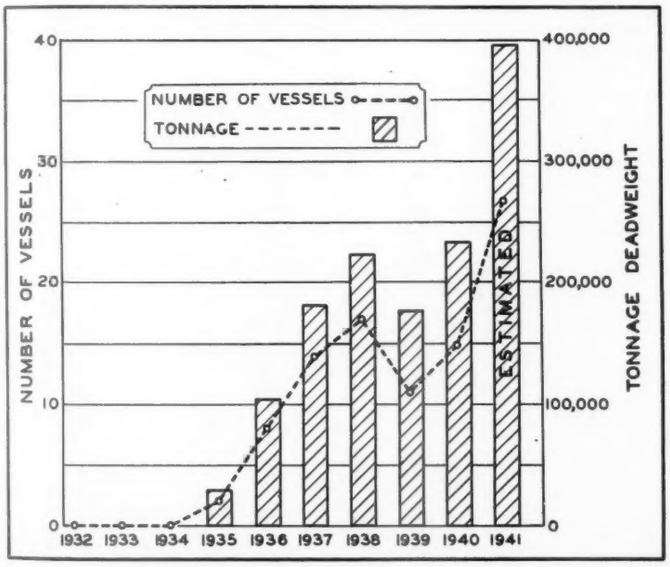
A comparison of the current tanker program with that of past years is shown in Table 1 which shows United States tanker deliveries for the 6 years preceding 1941. None was delivered during 1932, 1933, and 1934. In all, 67 tankers with an aggregate deadweight tonnage of 956,510 tons were delivered in those 6 years. Standard Oil Co. of New Jersey, with 20 vessels averaging 14,000 deadweight tons, led all the companies.

The expansion of tanker building in this country as shown by Table 1 parallels in a way the increase during World War and immediate post-war years when United States tanker construction was at its peak. More than 200 steel tankers of more than 2,000 gross tons each were built in this country from 1918 to 1921, inclusive. Fully 70 per cent of our present-day tanker fleet was built at that time. This fleet, of steel vessels of 2,000 gross tons and over, consisted of 364 vessels on January 1 of this year and of this total 253 were built during and immediately following the World War.

### Building Resumed in 1936

Tanker construction dropped abruptly when the war boom expired in 1921 and until 1930 not more than five tankers of our present fleet were delivered in any 1 year. In 1930 10 tankers were completed and in the following year 6. The next 3 years saw United States tanker construction at its lowest ebb in two decades. During that period not a single tanker left United States shipyards.

Building of tankers was resumed in 1935 when two were delivered. Eight were delivered in 1936 and an average of 14 in each succeeding year to 1941. This increase is laid to the large gain in shipments of crude oil and products from the Gulf Coast to East Coast ports in that period. In 1936, 343,000,000 bbl. of oil were transported in this route and in 1940 this amount had increased to an estimated 430,000,000 bbl., a gain of 90,000,000 bbl.




*Ten-year record of United States tanker construction*

**TABLE 1—UNITED STATES TANKER TONNAGE DELIVERED 1935-40**

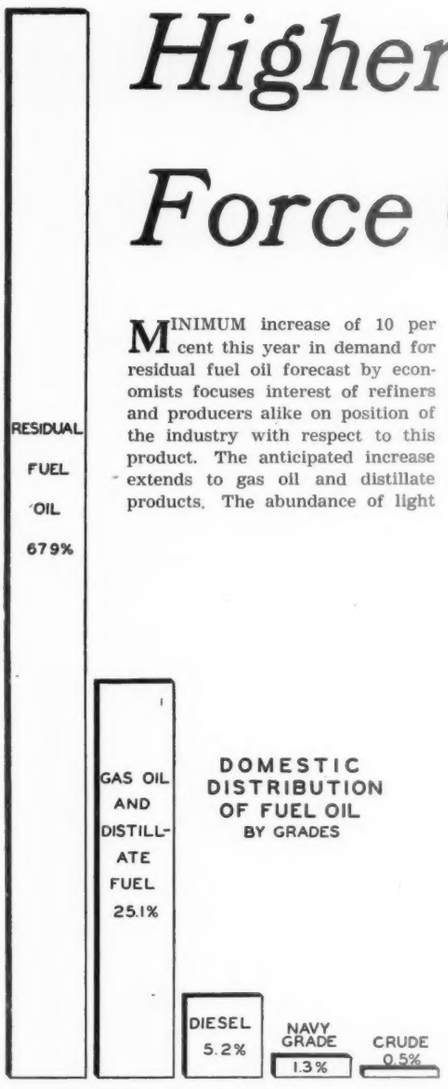
| | 1935 | | 1936 | | 1937 | | 1938 | | 1939 | | 1940 | | 6 years | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. | Dwt. | No. | Dwt. | No. | Dwt. | No. | Dwt. | No. | Dwt. | No. | Dwt. | No. | Dwt. |
| Socony-Vacuum* | 2 | 29,760 | .. | ..... | 2 | 30,800 | 1 | 4,400 | 2 | 32,700 | .. | ..... | 7 | 97,660 |
| Gulf | .. | ..... | 2 | 22,800 | 3 | 34,200 | 1 | 11,400 | .. | ..... | .. | ..... | 6 | 68,400 |
| Standard Oil Co. (New Jersey)* | .. | ..... | 2 | 25,730 | 4 | 52,000 | 6 | 78,000 | 2 | 32,600 | 6 | 93,632 | 20 | 281,962 |
| Pan American | .. | ..... | 4 | 56,600 | .. | ..... | 2 | 26,000 | .. | ..... | .. | ..... | 6 | 82,600 |
| Sun | .. | ..... | .. | ..... | 1 | 15,500 | 1 | 18,000 | .. | ..... | 1 | 17,955 | 3 | 51,455 |
| Texas | .. | ..... | .. | ..... | 3 | 37,200 | 1 | 12,600 | .. | ..... | 2 | 28,650 | 6 | 78,450 |
| Standard Oil Co. (California) | .. | ..... | .. | ..... | 1 | 13,000 | 1 | 13,000 | .. | ..... | 1 | 7,500 | 3 | 33,500 |
| Tide Water | .. | ..... | .. | ..... | .. | ..... | 1 | 12,750 | .. | ..... | .. | ..... | 1 | 12,750 |
| Bernuth-Lembcke | .. | ..... | .. | ..... | .. | ..... | 1 | 13,000 | .. | ..... | .. | ..... | 1 | 13,000 |
| Atlantic | .. | ..... | .. | ..... | .. | ..... | 2 | 36,800 | 1 | 18,000 | 1 | 19,405 | 4 | 74,205 |
| U. S. Navy | .. | ..... | .. | ..... | .. | ..... | .. | ..... | 3 | 48,900 | 3 | 55,028 | 6 | 103,928 |
| Keystone | .. | ..... | .. | ..... | .. | ..... | .. | ..... | 2 | 32,600 | .. | ..... | 2 | 32,600 |
| Union | .. | ..... | .. | ..... | .. | ..... | .. | ..... | 1 | 13,000 | 1 | 13,000 | 2 | 26,000 |
| Total | 2 | 29,760 | 8 | 105,130 | 14 | 182,700 | 17 | 225,950 | 11 | 177,800 | 15 | 235,170 | 67 | 956,510 |

*And subsidiaries.

# Higher Fuel Demand May Force Operating Changes

By H. STANLEY NORMAN

MINIMUM increase of 10 per cent this year in demand for residual fuel oil forecast by economists focuses interest of refiners and producers alike on position of the industry with respect to this product. The anticipated increase extends to gas oil and distillate products. The abundance of light burning stocks and the probability that heavy-fuel-consuming industry will expand at a proportionately higher rate concentrates interest on residuals. Furthermore, the domestic refining industry has demonstrated more than sufficient ability to keep ahead of demand for light fuels.


RESIDUAL FUEL OIL 67.9%
GAS OIL AND DISTILLATE FUEL 25.1%
DOMESTIC DISTRIBUTION OF FUEL OIL BY GRADES
DIESEL 5.2%
NAVY GRADE 1.3%
CRUDE 0.5%

***Residual grades dominate consumption***

The domestic producer's interest in the position of residual-fuel economy revolves around the practical certainty that Latin-American imports will increase if a deficiency of heavy burning oils develops in this country. There is a sharp division of opinion within the industry as to how the increased demand for residual should be supplied.

Prospects are that domestic residual-fuel demand this year will be nearly 370,000,000 bbl., based on an increase of slightly more than 10 per cent over 1940. Residual imports for domestic use last year were nearly 2,000,000 bbl. greater than exports. The export outlook is for a continued moderate decline. Prospects are that imports will increase but the extent is dependent on fulfillment of the predicted advance of 10 per cent in domestic demand and any advance in yields of residual fuel by United States refiners. One significant aspect of the residual-fuel outlook is that exports of this product have suffered a smaller reduction percentagewise than any other oil.

The domestic industry went into 1941 with 3,000,000 bbl. less residual fuel in storage than at the opening of 1940. Stocks of gas oil and distillate fuel are approximately 9,000,000 bbl. greater than those of a year ago which explains one reason why concern for residual is magnified.

Requirements for domestic fuels heavier than kerosene are divided about 67 per cent for residuals and 33 per cent for gas oil and distillates. Including kerosene, the domestic demand is divided on this basis: Residual, 59 per cent; gas oil and distillate, 28 per cent, and kerosene, 12 per cent.

Data in the accompanying table, drawn from the detailed report on fuel-oil distribution in 1939 by A. T. Coumbe, associate economic analyst of the Bureau of Mines, reveal a more clearly defined view of future fuel requirements by states and general divisions of the country.

## WHERE AND HOW FUEL OIL IS CONSUMED

(Thousands

| Pacific Coast: | Railroads | Vessels | Gas and electric power plants | Smelters, mines, manufacturing | Heating oils | Navy, Coast Guard | Oil company fuel | Miscellaneou |
|---|---|---|---|---|---|---|---|---|
| California | 17,561 | 24,239 | 436 | 5,715 | 3,739 | 6,257 | 8,350 | 3,449 |
| Oregon | 3,179 | 286 | 1,188 | 1,419 | 1,973 | 101 | 99 | 496 |
| Washington | 1,108 | 1,493 | 599 | 2,076 | 3,236 | 46 | 146 | 458 |
| Arizona | 860 | ..... | 274 | 719 | 173 | 25 | ..... | 156 |
| Nevada | 2,709 | ..... | 19 | 93 | 219 | 6 | ..... | 61 |
| Total Pacific Coast | 25,417 | 26,018 | 2,516 | 10,022 | 9,340 | 6,435 | 8,595 | 4,620 |
| Pacific Coast % of U. S. | 40.2 | 32.8 | 7.8 | 14.9 | 6.9 | 51.6 | 17.5 | 32.1 |
| Rocky Mountain: | | | | | | | | |
| Idaho | 312 | ..... | 4 | 61 | 25 | ..... | ..... | 77 |
| Montana | 1,418 | ..... | 3 | 10 | 134 | 6 | 241 | 130 |
| Wyoming | 1,108 | ..... | 11 | 43 | 57 | ..... | 510 | 117 |
| Utah | 232 | ..... | 20 | 10 | 39 | 1 | 126 | 46 |
| Colorado | 269 | ..... | 72 | 48 | 207 | ..... | 72 | 185 |
| New Mexico | 228 | ..... | 45 | 53 | 57 | ..... | 70 | 99 |
| Total Rocky Mountain | 3,567 | ..... | 155 | 225 | 519 | 7 | 1,019 | 654 |
| Rocky Mountain % of U. S. | 5.6 | ..... | .5 | .3 | .4 | .1 | 2.0 | 4.5 |
| North Central: | | | | | | | | |
| North Dakota | 18 | ..... | 33 | 12 | 299 | 1 | ..... | 188 |
| South Dakota | 96 | ..... | 132 | ..... | 439 | ..... | 2 | 209 |
| Minnesota | 173 | 23 | 145 | 370 | 4,620 | 1 | 9 | 372 |
| Nebraska | 241 | ..... | 293 | 50 | 1,543 | 25 | 18 | 279 |
| Iowa | 154 | ..... | 294 | 120 | 1,823 | 7 | 1 | 485 |
| Wisconsin | 46 | 3 | 318 | 615 | 4,344 | 4 | 7 | 218 |
| Illinois | 522 | 226 | 205 | 3,206 | 15,470 | 107 | 1,841 | 549 |
| Indiana | 61 | 254 | 162 | 3,284 | 1,900 | .... | 3,007 | 259 |
| Michigan | 64 | 174 | 252 | 3,715 | 4,907 | 16 | 492 | 308 |
| Ohio | 118 | 90 | 66 | 4,474 | 1,083 | 57 | 1,932 | 300 |
| Kentucky | 78 | 139 | 43 | 169 | 229 | 22 | 307 | 116 |
| Tennessee | 221 | 53 | 40 | 122 | 98 | 2 | 7 | 126 |
| Total North Central | 1,792 | 962 | 1,983 | 16,137 | 36,755 | 242 | 7,623 | 3,409 |
| North Central % of U. S. | 2.8 | 1.2 | 6.2 | 24.0 | 27.0 | 2.0 | 15.5 | 23.7 |
| South Central: | | | | | | | | |
| Missouri | 1,704 | 118 | 226 | 688 | 5,763 | 144 | 347 | 289 |
| Kansas | 3,898 | ..... | 250 | 229 | 416 | ..... | 2,456 | 322 |
| Texas | 14,181 | 14,294 | 245 | 182 | 596 | 1,616 | 10,380 | 493 |
| Oklahoma | 5,537 | .... | 180 | 91 | 263 | .... | 1,846 | 195 |
| Arkansas | 1,259 | 22 | 48 | 97 | 189 | 67 | 226 | 243 |
| Louisiana | 3,188 | 4,462 | 171 | 570 | 356 | 334 | 959 | 1,277 |
| Mississippi | 138 | 9 | 36 | 55 | 55 | 24 | 9 | 302 |
| Alabama | 93 | 1,458 | 32 | 175 | 86 | 90 | 20 | 159 |
| Total South Central | 29,998 | 20,363 | 1,188 | 2,087 | 7,724 | 2,275 | 16,243 | 3,280 |
| South Central % of U. S. | 47.4 | 25.7 | 3.7 | 3.1 | 5.6 | 18.2 | 33.1 | 22.8 |
| New England: | | | | | | | | |
| Maine | 10 | 26 | 288 | 978 | 1,116 | 62 | 31 | 25 |
| New Hampshire | 1 | ..... | 326 | 274 | 1,195 | 7 | 2 | 7 |
| Vermont | 3 | 2 | 30 | 94 | 536 | ..... | 6 | 4 |
| Massachusetts | 41 | 1,615 | 2,715 | 5,145 | 13,251 | 281 | 896 | 89 |
| Rhode Island | ..... | 155 | 1,971 | 2,507 | 2,761 | 137 | 253 | 48 |
| Connecticut | 95 | 113 | 1,653 | 1,537 | 5,404 | 121 | 22 | 16 |
| Total New England | 150 | 1,911 | 6,983 | 10,535 | 24,263 | 608 | 1,210 | 189 |
| New England % of U. S. | .2 | 2.4 | 21.8 | 15.7 | 17.8 | 4.9 | 2.5 | 1.3 |
| Middle Atlantic: | | | | | | | | |
| New York | 559 | 4,765 | 5,680 | 4,954 | 29,614 | 408 | 1,556 | 230 |
| New Jersey | 1,682 | 15,212 | 6,421 | 6,772 | 12,052 | 741 | 6,231 | 214 |
| Pennsylvania | 351 | 2,625 | 1,935 | 7,991 | 8,417 | 463 | 5,264 | 277 |
| Delaware | ..... | 20 | 15 | 1,144 | 332 | ..... | 59 | 7 |
| Maryland | 201 | 2,797 | 423 | 2,964 | 2,285 | 322 | 850 | 493 |
| District of Columbia | 4 | 117 | 315 | 67 | 1,760 | 31 | 6 | 162 |
| Total Middle Atlantic | 2,797 | 25,536 | 14,789 | 23,892 | 54,460 | 1,965 | 13,966 | 1,383 |
| Middle Atlantic % of U. S. | 4.4 | 32.2 | 46.1 | 35.6 | 40.0 | 15.8 | 28.5 | 9.6 |
| South Atlantic: | | | | | | | | |
| Virginia | 120 | 1,794 | 315 | 323 | 1,187 | 632 | 81 | 125 |
| West Virginia | ..... | 1 | 4 | 788 | 58 | ... | 116 | 26 |
| North Carolina | 10 | 31 | 113 | 115 | 374 | 76 | 4 | 125 |
| South Carolina | 17 | 115 | 70 | 430 | 145 | 99 | 74 | 113 |
| Georgia | 24 | 375 | 403 | 778 | 355 | 2 | 70 | 235 |
| Florida | 114 | 2,148 | 3,520 | 1,711 | 1,052 | 131 | 44 | 244 |
| Total South Atlantic | 285 | 4,464 | 4,425 | 4,145 | 3,171 | 940 | 389 | 868 |
| South Atlantic % of U. S. | .5 | 5.6 | 13.8 | 6.2 | 2.3 | 7.5 | .8 | 6.0 |
| Grand total U. S., 1939 | 63,235 | 79,254 | 32,039 | 67,043 | 136,232 | 12,472 | 49,045 | 14,403 |
| Per cent by uses | 13.8 | 17.3 | 7.0 | 14.7 | 29.8 | 2.7 | 10.7 | 3.2 |
| Grand total U. S., 1938 | 57,829 | 74,266 | 27,567 | 60,038 | 118,323 | 11,756 | 43,517 | 11,652 |

*No. 1 fuel oil sold for range burners added to state totals.

Assuming that 1940 fuel-oil consumption breakdown follows the percentage curves of a year earlier this is the approximate division by uses: Railroads, 69,100,000 bbl.; vessels, 86,500,000; gas and electric-power plants, 35,100,000; smelters, mines and manufacturing, 73,525,000; heating oils, 149,100,000; Army, Navy, and Coast Guard, 13,500,000; oil-company operations, 53,500,000, and miscellaneous, 16,000,000 bbl.

The record of burner shipments in 1940 covering a majority of manufacturers making units for consumption of No. 1 standard fuel and heavier oils indicates that the substantial increases in use of domestic heaters registered through each of the past few years were accelerated in 1940 and will be a potent factor in 1941 demand. Shipments for 1940 were 264,232 burner units, an increase of 22.9 per cent over 1939 and 89.8 per cent over 1938.

The 1939 detailed breakdown of fuel-oil consumption which was released early this month presents conclusions of interest to refiners and the general industry. Statistics disclose that seven states each consume more than 20,000,000 bbl. of fuel oil and combined they accounted for 61.8 per cent of the total domestic demand. The states in the order of their volume of consumption are California, 69,790,000 bbl.; New York, 48,154,000; New Jersey, 48,087,000; Texas, 42.012,000; Pennsylvania, 27,285,000; Massachusetts, 24,392,000 and Illinois, 22,561,000 bbl.

Fuel oil for heating accounts for the largest single phase of consumption. Nearly 30 per cent of all fuel-oil requirements go into the production of heat for personal comfort. The seven leading states in consumption of heating oils, each accounting for 5,000,000 bbl. or more annually, are New York, 29,614,000 bbl.; Illinois, 15,470,000; Massachusetts, 13,251,000; New Jersey, 12,052,000; Pennsylvania, 8,417,000; Missouri, 5,763,000 and Connecticut, 5,404,000 bbl. Combined, the seven states consume 66 per cent of the nation's total.

Marine operations are the second largest consumer of fuel oil. Five states on the Pacific, Atlantic and Gulf coasts account for nearly 80 per cent of the marine fuel-oil trade. The five in order of consumption rank are California, New Jersey, Texas, New York, and Louisiana.

Smelters, mines and factories consume about 14.7 per cent of the nation's fuel oil and distribution is apparently spread over a wider area than any other class of consumption. The six leading states in the smelter, mines and manufacturing classification, each using more than 4,000,000 bbl., consumed in aggregate only 52.3 per cent of the total. Ranking of the six leading states is Pennsylvania, 7,991,000 bbl.; New Jersey, 6,772,000; California, 5,715,000; Massachusetts, 5,145,000; New York, 4,954,000, and Ohio, 4,474,000 bbl.

Fuel-oil consumption by railroads is concentrated on the Pacific Coast and in the south central states. Six states, California, Texas, Oklahoma, Kansas, Louisiana and Oregon, in that order, are assigned 75 per cent of the railroad consumption.

Gas and electric power plants use only 7 per cent of the domestic fuel oil. Florida is the only state consuming more than 1,500,000 bbl. annually in this service group outside the northeastern section of the country. Other ranking states are New Jersey, New York, Massachusetts, Rhode Island, Pennsylvania, and Connecticut.

The defense program gives positive evidence that substantial increases will be experienced this year and more pronouncedly in 1942 in the consumption of fuel oil by smelters, mines and factories particularly and by railroads. Out of the 63,235,000 bbl. of fuel oil consumed by railroads in 1939 there were 53,056,000 bbl. of residual. Increased railroad operation in moving raw and semifinished materials to defense manufacturing plants will cause a material bulge in residual demand for this service alone.

If domestic residual-fuel-oil demand this year reaches 370,000,000 bbl., exports run about 15,000,000 bbl. and transfers and imports remain unchanged, refinery runs of 1,432,000,000 bbl. would be indicated. The hypothesis assumes that yields from crude in domestic refinery operations will remain around 25 per cent.

Economics of increasing yields of heavy fuel oil is not currently attractive to refiners. Bunker C fuel oil on the Gulf Coast is currently offered in cargoes at 72 to 75 cents per barrel, about 1.8 cents per gallon.

The trend of refinery prices for residual fuel over the next few months will have a strong influence on whether the increased domestic demand is supplied from United States sources or drawn more liberally from Latin America. Still another factor among the intangible considerations is the possible settlement of the Mexican expropriation issue. If expropriated companies are permitted to return to Mexico under a long-term lease or other arrangements it may be necessary to fit greater supplies from that source into domestic economics.

Clues as to the classes of consumers that will account for the most substantial increases in residual demand and the parts of the country where greater supplies will be needed may be drawn from the table. Variations in the breakdown of distribution drawn from 1939 detail may be expected in correlation with location of defense industries.

## IN THIS COUNTRY

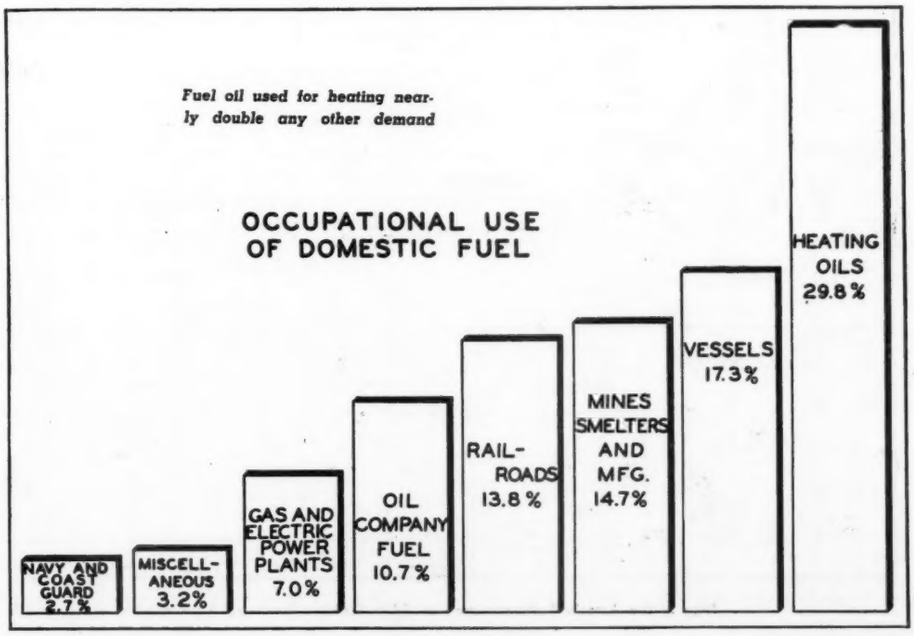
of barrels)

| State totals* | | | | | |
|---|---|---|---|---|---|
| Gas oil and distillate | Diesel fuel | Navy grade | Residual fuel | Crude oil | Fuel oil total 1939 |
| 2,586 | 10,167 | 5,183 | 51,185 | 669 | 69,790 |
| 1,198 | 408 | 39 | 7,107 | ..... | 8,752 |
| 1,865 | 789 | 1 | 6,538 | ..... | 9,193 |
| 249 | 302 | ..... | 1,669 | ..... | 2,220 |
| 176 | 69 | 4 | 2,860 | ..... | 3,109 |
| 6,074 | 11,735 | 5,227 | 69,359 | 669 | 93,064 |
| 5.3 | 49.2 | 8.5 | 22.4 | 30.2 | 20.4 |
| 63 | 55 | ..... | 365 | ..... | 483 |
| 189 | 83 | 6 | 1,669 | ..... | 1,947 |
| 139 | 81 | ..... | 1,633 | ..... | 1,853 |
| 107 | 34 | ..... | 342 | 2 | 485 |
| 345 | 75 | ..... | 454 | 6 | 880 |
| 114 | 77 | ..... | 354 | 12 | 557 |
| 957 | 405 | 6 | 4,817 | 20 | 6,205 |
| .8 | 1.7 | .1 | 1.6 | .9 | 1.3 |
| 494 | 38 | ..... | 62 | ..... | 594 |
| 591 | 40 | ..... | 260 | ..... | 891 |
| 4,693 | 165 | ..... | 1,051 | ..... | 5,909 |
| 1,584 | 218 | ..... | 681 | ..... | 2,483 |
| 2,094 | 222 | ..... | 653 | ..... | 2,969 |
| 4,178 | 152 | ..... | 1,462 | 1 | 5,793 |
| 12,446 | 475 | ..... | 9,558 | 82 | 22,561 |
| 1,670 | 341 | ..... | 6,949 | 17 | 8,977 |
| 4,189 | 221 | ..... | 5,709 | ..... | 10,119 |
| 1,588 | 151 | ..... | 6,393 | 29 | 8,161 |
| 292 | 145 | ..... | 646 | 27 | 1,110 |
| 268 | 90 | ..... | 337 | ..... | 695 |
| 34.087 | 2,258 | ..... | 33,761 | 156 | 70,262 |
| 29.7 | 9.5 | ..... | 10.9 | 7.0 | 15.4 |
| 4,343 | 262 | ..... | 4,641 | 93 | 9,339 |
| 584 | 165 | ..... | 6,851 | 5 | 7,605 |
| 630 | 2,005 | 325 | 38,342 | 710 | 42,012 |
| 206 | 81 | ..... | 7,722 | 103 | 8,112 |
| 409 | 68 | ..... | 1,668 | 11 | 2,156 |
| 510 | 983 | ..... | 9,417 | 408 | 11,318 |
| 185 | 167 | 5 | 274 | ..... | 631 |
| 213 | 194 | ..... | 1,720 | ..... | 2,127 |
| 7,080 | 3,925 | 330 | 70,635 | 1,330 | 83,300 |
| 6.2 | 16.4 | 5.4 | 22.8 | 60.0 | 18.2 |
| 1,088 | 42 | ..... | 1,515 | ..... | 2,645 |
| 1,080 | 46 | ..... | 686 | ..... | 1,812 |
| 498 | 13 | ..... | 164 | ..... | 675 |
| 10,141 | 319 | 175 | 13,757 | ..... | 24,392 |
| 2,149 | 10 | ..... | 5,734 | ..... | 7,893 |
| 4,621 | 106 | ..... | 4,337 | ..... | 9,064 |
| 19,577 | 536 | 175 | 26,193 | ..... | 46,481 |
| 17.1 | 2.2 | 2.9 | 8.4 | ..... | 10.2 |
| 23,587 | 825 | 115 | 23,605 | 22 | 48,154 |
| 10,454 | 1,936 | 127 | 35,569 | 1 | 48,087 |
| 6,138 | 589 | 16 | 20,522 | 20 | 27,255 |
| 363 | 4 | ..... | 1,229 | ..... | 1,596 |
| 1,859 | 280 | 63 | 8,016 | ..... | 10,218 |
| 1,314 | 72 | ..... | 1,155 | ..... | 2,541 |
| 43,715 | 3,706 | 321 | 90,096 | 43 | 137,881 |
| 38.1 | 15.5 | 5.3 | 29.1 | 1.9 | 30.2 |
| 1,115 | 379 | 1 | 3,044 | ..... | 4,539 |
| 101 | 24 | ..... | 921 | ..... | 1,046 |
| 546 | 175 | ..... | 209 | ..... | 930 |
| 281 | 94 | ..... | 734 | ..... | 1,109 |
| 413 | 168 | ..... | 1,707 | ..... | 2,288 |
| 757 | 462 | 55 | 8,564 | ..... | 9,838 |
| 3,213 | 1,302 | 56 | 15,179 | ..... | 19,750 |
| 2.8 | 5.5 | .9 | 4.9 | ..... | 4.3 |
| 114,703 | 23,867 | 6,115 | 310,040 | 2,218 | 456,943 |
| 25.1 | 5.2 | 1.3 | 67.9 | .5 | ..... |
| 96,237 | 21,204 | 7,592 | 280,753 | 2,064 | 407,850 |

### REFINERY YIELDS OF RESIDUAL FUEL, 1940

| Month— | Crude runs | Residual production | Per cent yield |
|---|---|---|---|
| January | 106,530,000 | 28,082,000 | 26.36 |
| February | 101,766,000 | 24,680,000 | 24.25 |
| March | 110,079,000 | 26,870,000 | 24.40 |
| April | 106,979,000 | 25,372,000 | 23.71 |
| May | 111,817,000 | 26,548,000 | 23.74 |
| June | 108,237,000 | 25,469,000 | 23.53 |
| July | 107,902,000 | 25,248,000 | 23.39 |
| August | 108,756,000 | 26,451,000 | 24.32 |
| September | 107,756,000 | 25,504,000 | 23.66 |
| October | 109,394,000 | 27,944,000 | 25.54 |
| November | 105,364,000 | 26,125,000 | 24.79 |
| December | 109,703,000 | 27,925,000 | 25.45 |
| Total | 1,294,283,000 | 316,218,000 | *24.43 |

*Average for year.


Fuel oil used for heating nearly double any other demand
OCCUPATIONAL USE OF DOMESTIC FUEL
NAVY AND COAST GUARD 2.7%
MISCELLANEOUS 3.2%
GAS AND ELECTRIC POWER PLANTS 7.0%
OIL COMPANY FUEL 10.7%
RAILROADS 13.8%
MINES SMELTERS AND MFG. 14.7%
VESSELS 17.3%
HEATING OILS 29.8%

# New Mexico Drilling Activity Centers in Maljamar Area

By D. H. STORMONT

ARTESIA, N. M.—Drilling activity in Southeast New Mexico is shifting to the oldest oil-producing area in that part of the state—the Artesia-Maljamar area of northeast Eddy County and northwest Lea County. Oil was first discovered in this area in 1923, but with the exception of the developing of the Loco Hills field, development has been along conservative lines. This is due largely to the fact that oil production is marketed only locally or exported, which has tended to slow activity.

Shift in activity to the Artesia-Maljamar area is plainly brought out by the number of completions during recent years. At the first of 1937 there were 423 oil wells in the Artesia area and during that year 47 were added as compared with 583 oil completions in Lea County. In 1938, 73 were added in the Artesia-Maljamar area and 432 new oil wells were added in Lea County, exclusive of those in Maljamar. In 1939 a total of 144 were added in the former area, as compared with 368 oil completions in the latter. Last year the trend continued, 233 oil wells being added in the Artesia-Maljamar area while Lea County, exclusive of Maljamar, had only 249 oil producers added. And so far this year this oil-producing area is leading the state in the number of new wells.

The growth of this area's activity is further brought out by annual production figures. In 1938 the Artesia-Maljamar area produced 2,202,411 bbl. of oil, and in 1939 its output was 2,688,558 bbl. Last year its production jumped to 5,318,925 bbl.

Production in this area is obtained largely from pays locally known as the Artesia sand zone, the Grayburg, Jackson and Maljamar lime pays and shallower sand pays. Much of the present activity is a development of the shallower sand pays, though some lime production is being developed.

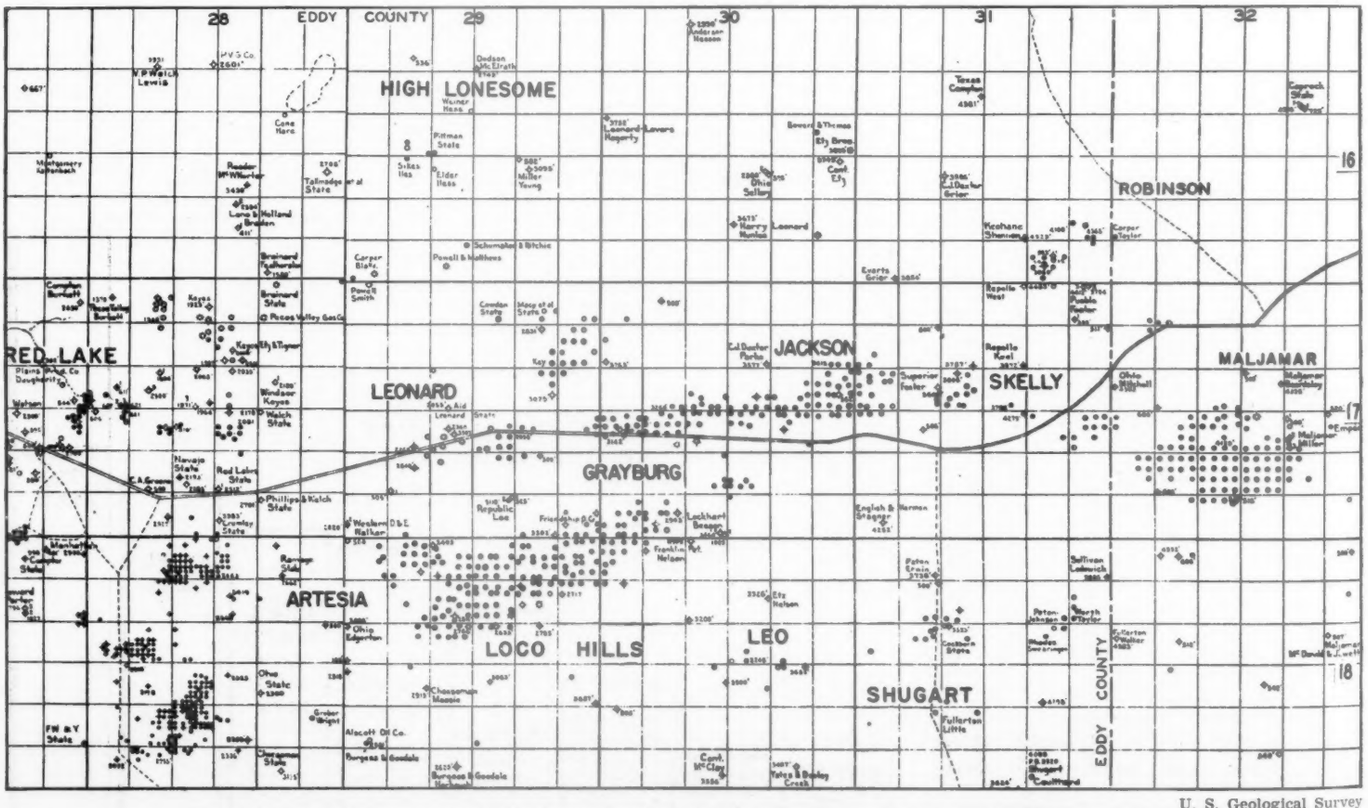
## General Geology

The producing horizons in the general area are believed to be all found in the San Andrea lime of the Permian series. This formation outcrops about 30 miles west of the town of Artesia, and the upper 200-400 ft. is the Artesia water-producing zone proper in Pecos Valley. Approximate thickness of this lime has been established at about 2,000 ft. In the deepest test drilled in the immediate area, in Section 34-21-26, the San Andres was drilled from a depth of 2,000 to 4,100 ft., with the Delaware sand being found below 4,100 to 6,300 ft., total depth.

Main structural features is a lime high plunging from the west, extending through the Maljamar field and tying in with the Vacuum and other fields of Lea County. Trend of the high is about on the line of the Grayburg, Jackson and Maljamar fields, as shown on the accompanying map, all of which produce from lime or sandy lime pays. Minor features are thought to be roughly at right angles to this main high and account in part for the accumulation of oil and gas in the sand fields flanking this main feature. Generally, though, production is controlled in the main by cementation, gradation and the lenticular nature of the sand pays with local structural conditions determining accumulation.

Oil production from lime or sandy lime pay zones has been established along the high for a distance of over 20 miles, with the best pay averaging about ½ mile in width and lighter wells to a width of about 1 mile. Cementation and porosity control to a large extent the size of wells completed in the limy pays so that commercial production is not continuous along the high. The three aforementioned lime fields produce from separate zones, the Graybury being deeper stratigraphically and the Maljamar the shallowest. In the Jackson area the Grayburg is found to contain water. Some sand production also has been opened on or near the crest of the high.

The sand pay zones flanking this high are thought by some geologists to be shore-line deposits on the south flank and lagoonal on the north. In the Loco Hills field there is a gradual cementation of the main sand pay, with but little thinning of the zone, as wells were drilled north. In the Root area on the north flank of the high,




U. S. Geological Survey

*Map of the Artesia-Maljamar area of Eddy County, Southeast New Mexico, where much of the state's drilling is concentrated*

*Medium-weight rotary drilling on Barney Cockburn's Baish lease in the Maljamar field*

samples run by C. A. Aston, geologist of Smith, N. M., were found to contain bentonite interassociated with the sand in the pay zone. Size of the wells was found to be controlled to a large extent by amount of bentonite present in the pay.

Base of the salt beds and the top of the lime are used to an extent as markers in local areas, especially along the lime high. However, the "red sand" has proven to be the best reflection of lower structural conditions, with the presence or absence of water in it having no apparent bearing on oil production in the lower pay horizons. Where present, the base of the salt is generally found about 1,200 ft. above the top of the lime. The red sand is topped about 300 ft. above the top of the lime. First sand pays are usually encountered from 175 to 200 ft. below the top of the limestone, but due to gradation at the top of the lime there is some variation even in local areas.

### Maljamar Most Active

The Maljamar pool on the Lea-Eddy county line is the center of much of the activity, after remaining in more or less a dormant stage for the past 14 years. Discovered in July 1926, there were only 31 producing wells at the first of 1940. Development picked up during 1940 so that at the first of this year there were 85 producers. During this year it is expected almost 100 wells will be drilled so that it may be the state's most active pool throughout 1941. At present there are 18 active rigs operating in this field.

Earliest production in this pool was from a 4,100-ft. sandy lime. Four wells were completed in this "Maljamar" lime pay prior to 1931 for initial potentials of 50 to 250 bbl., and after 10 years' production are still flowing and have potentials nearly as high as their initial. Production from this lime pay is not extensive, however, so that present drilling in the field is largely a development of a 3,900-ft. sand. Some wells also have been completed in a 2,400-ft. sand. Oil recovery from the shallow pay, though, is expected to be about one-half that yielded by the 3,900-ft. sand.

In the Grayburg-Jackson area development of the main 3,900-foot lime and sand pays likewise was undertaken on an enlarged scale last year and will be continued this year. Number of producers in this area was raised from 125 to 216 during 1940, but somewhat fewer probably will be drilled this year. Some 10 rigs are drilling there at the present time.

In the sand fields flanking this lime high on the north and south drilling is being carried on at rates below those of a year ago. In the Loco Hills field where 75 producers were completed during 1940, only four rigs are operating. This field, which is expected to be placed under pressure maintenance in the near future, is practically drilled up but a few rigs will be kept in operation throughout the year.

Drilling activity throughout Southeast New Mexico is considerably below that of a year ago, there being 80 rigs active at this time as compared with 108 a year ago. At that time development of Loco Hills was at its height, and since no other outstanding fields have been discovered in the past 3 years total activity is lower. Outside of the Maljamar field, drilling in Lea County proven areas is at a low level. No fields were discovered in Lea during the past year and its three 1939 discoveries have received little development.

### Three New Areas in 1940

In Eddy County three new oil-producing areas were added last year. The Dayton field, near the town of Dayton in Township 18s, Range 26s, received the most development of the three and now has five producing wells. This pool, opened in July 1940 by the Martin Yates, Jr. 1 E. L. McCall, is producing from a sand pay at 4,030 ft. In the Barber area east of the old Getty field Neil Wills 1 F. G. Keyes, in NE SE 15-20-30, was completed for a 200-bbl. producer in June of last year. Completed at 1,600 ft. in a sand pay, two other producers have been completed as offsets. This area is apparently separated from production in Sections 17 and 20 as the Continental Oil Co. 1 Barrett in northwest Section 22 was dry at 1,953 ft.

Third new producing area added was at the Bowers & Thomas 1 Etz, shown on the map 5½ miles north of the Jackson area. The 1 Etz was completed in November at 3,200 ft. for a 10-bbl. pumper. Activity in these new discoveries, and work in the Red Lake, Leonard and Shugart fields, will account for a majority of all other drilling done in the area.

# *Eight Per Cent Increase for Gasoline Demand Indicated*

WASHINGTON, D. C., Feb. 25.—Demand for 1,619,350 bbl. of motor fuel daily in March was forecast here last week by the Bureau of Mines. The total motor-fuel demand calculated at 50,200,000 bbl. in March provides for 48,200,000 bbl. in domestic consumption.

The total motor-fuel demand in prospect for March is 11 per cent greater than forecast by the bureau for February and is 8 per cent higher than the actual consumption for the same month a year ago.

In supplying the probable motor-fuel demand for next month, the bureau estimates domestic crude requirements at 113,320,000 bbl. or 3,655,500 bbl. daily, which is an increase of 26,600 bbl. in the average yield over the February forecast. Thirteen of the producing states received increases in the breakdown of crude demand while four dropped behind February and three were unchanged.

Estimated daily average crude demand by states (in barrels):

| | Mar. | Feb. |
|---|---|---|
| Texas | 1,327,400 | 1,312,900 |
| California | 596,400 | 595,700 |
| Oklahoma | 437,400 | 442,500 |
| Illinois | 335,200 | 342,100 |
| Louisiana | 291,300 | 288,600 |
| Kansas | 194,200 | 193,200 |
| New Mexico | 103,900 | 100,700 |
| Wyoming | 83,900 | 74,600 |
| Arkansas | 69,700 | 66,100 |
| Pennsylvania | 48,100 | 50,000 |
| Michigan | 47,700 | 47,500 |
| Indiana | 22,600 | 22,500 |
| Montana | 21,900 | 20,000 |
| Mississippi | 20,300 | 16,100 |
| Kentucky | 14,200 | 15,400 |
| New York | 13,000 | 12,900 |
| West Virginia | 11,100 | 10,900 |
| Ohio | 10,100 | 10,100 |
| Colorado | 3,900 | 3,900 |
| Nebraska | 3,200 | 3,200 |
| Total | 3,655,500 | 3,628,900 |

"Current data," the bureau reported, "indicate an increase in the total demand for all oils that verifies the long-term estimates as published in the January forecast. As pointed out at that time, only a moderate rate of increase in total demand for the first quarter of 1941 could be expected because of the exceptionally high demand in the same period of 1940.

"An analysis of current data, as compared with the same period last year, indicates that the domestic demand for motor fuel may be greater than anticipated, that the domestic demand for distillate fuel oils will be no greater, and possibly less, than the abnormal demand for the first quater last year, when a gain of 25 per cent over 1939 was recorded; that the domestic demand for residual fuel oils will show a moderate increase over the exceptionally high figures of last year; and that the total volume of exports has declined, while imports of crude and residual fuel have increased substantially."

Included in the estimated domestic demand for 48,200,000 bbl. of motor fuel in March is a calculation that finished stocks will increase 2,600,000 bbl., which is more than 1,000,000 bbl. less than the actual additions a year ago.

Benzol production and direct sales of natural gasoline are estimated at 1,600,000 bbl., making an indicated refinery production of 51,200,000 bbl. This is distributed among the various refinery districts as follows: East Coast, 6,760,000 bbl.; Appalachian, 1,930,000; Indiana-Illinois, 11,250,000; Oklahoma, 2,690,000; Kansas-Missouri, 2,840,000; inland Texas, 3,420,000; Texas Gulf Coast, 12,220,000; Louisiana Gulf Coast, 1,410,000; inland Louisiana-Arkansas, 910,000; Rocky Mountain, 1,390,000, and California 6,380,000 bbl.

# STATE CAPITALS...

## OKLAHOMA

THE CORPORATION COMMISSION will hold hearings at Oklahoma City February 28 on applications by the Thornton Co. and Wellsville Oil Co. for authority to install and operate a water-flood project on two Bartlesville-sand producing properties in Rogers County, Oklahoma.

Thirty-three wells on the Thornton Co. lease currently produce an average of 5 bbl. daily and the 20 wells on the Wellsville Oil Co. lease average 5½ bbl. daily.

REP. JOHN T. LEVERGOOD of Shawnee has introduced a bill requiring the making of a bond for $5,000 for each drilling operation in Oklahoma to protect laborers and material men.

The bond would be filed with the Corporation Commission and would extend over such time as required to drill, complete and equip the well. Separate bonds would be made for each well drilled. The bond would apply to the operator, contractors, firm or corporation drilling the well. The bill provides for a filing fee of $3 on each bond, half going to the commission and half to the county.

## TEXAS

AVERAGE BOTTOM-HOLE pressure in the East Texas field on February 8 was 1,050.93 lb. per sq. in., the Railroad Commission revealed here last week. This month's pressure is only 0.80 lb. below the average on January 8. Pressure averages are compiled from field observations on key wells.

CLAYTON BRAY of Longview, Tex., has introduced a bill providing for proration of natural-gas condensate by the Railroad Commission in line with the market demand and conservation needs.

Another measure was introduced by Representative Bray which would include well producing under gas lift or any other artificial means of raising the oil in the definition of marginal wells.

EXECUTIVE APPROVAL has been given to a law authorizing the state Land Board to lease Matagorda Bay, Texas Gulf Coast, to the federal Government for an aerial target range. The law restricts the area to be leased to 250,000 acres.

EIGHT EXCEPTIONS to Rule 37 covering spacing minimums in Texas were granted last week by the Railroad Commission. General American Oil Co., Paul L. Miller, Humble Oil & Refining Co., C. F. Wencker, and Tex-Jersey Oil Corp. were among those receiving exceptions.

FIELD RULES for 10 Texas producing areas have been established by the Railroad Commission.

For the Vogtsberger field, Archer County, the commission set 20-acre proration units, with 40 acres optional, if the well is 933 ft. from the nearest well on the same lease. No well is to be drilled nearer than 466 ft. from a property line. The allowable is to be based half on acreage and half on wells.

In the K.M.A.-Ellenburger pay, Wichita and Archer counties, 20-acre units, with 40 acres optional, and a 660-330-ft. pattern was set. Allowable was fixed 50-50, acreage and wells.

Greens Lake, Galveston County, 20-acre units, with a 933-467-ft. pattern. Allowable will be 25 per cent on wells and 75 per cent on acreage.

South Charamousca, Duval County, 10-acre units, 660-330-ft. drill pattern, and allowables half on acreage and half on wells.

A 660-330-ft. drill pattern was ordered for the Dale, West Dale, South Dale, Bee Creek, Bateman and Riddle fields in Caldwell and Bastrop counties.

## KANSAS

KANSAS MEMBERSHIP in the interstate oil compact will be extended 2 years when Gov. Payne Ratner signs the bill which was given final legislative approval in Topeka February 20.

## ILLINOIS

A TAX of 5 cents per 1,000 cu. ft. on all natural gas produced in or imported into the state is proposed in a bill introduced in the legislature by Rep. Paul Powell (Dem.), of Vienna.

The bill supplements a similar measure introduced 3 weeks ago by Mr. Powell calling for a tax of 5 cents per barrel on all oil produced in or imported into the state.

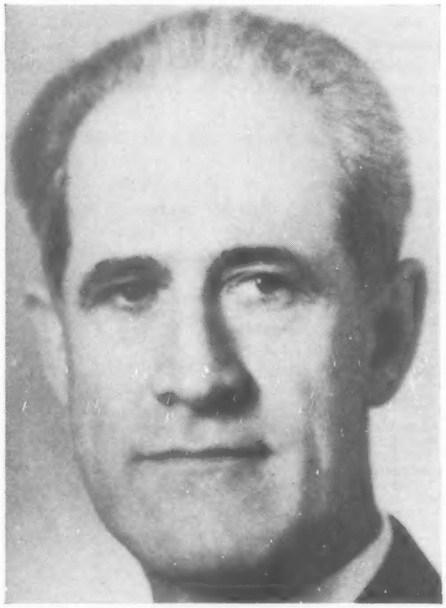
## CALIFORNIA

THE CONSERVATION COMMITTEE of California oil producers recommended a March oil-production quota of 571,500 bbl. daily at its meeting February 20 the same as for February.

A. H. Bell, chairman, appointed an elections subcommittee to handle details of the annual election of field committee members, the chairmen and vice chairmen of which become members and alternates, respectively, of the conservation committee.

The committee estimates that 86 wells will have been completed by the end of February and will require a March allotment of 7,972 bbl. per day. In addition, reconditioned and recompleted wells will require an allotment of 225 bbl. per day, making a total of 8,197 bbl. of new daily allowable. To offset that figure, natural decline, suspensions and abandonments of present producing wells will total only 4,500 bbl., leaving 3,697 bbl. to be subtracted from daily production rates by modifications in the uniform curtailment formula.

## COURTS OIL INDUSTRY . . .



*GOV. HARLAN J. BUSHFIELD, of South Dakota, has recommended to the legislature that the state issue a $25,000-bonus invitation to the oil industry to develop commercial production there*

## MICHIGAN

PRODUCING OIL WELLS in Michigan totaled 2,928 on December 31, according to a report of the Michigan Geological Survey. The net gain for the year was 244 while the number of gas wells increased from 478 to 503. The report shows that the Grand Rapids (Kent-Ottawa counties) district led with 457 wells, and Midlands Porter field second with 250 producing wells. Other fields where wells total 100 or more are: West Branch 225; North Buckeye 206, Mount Pleasant (Chippewa-Greendale) 183, Salem-Allegan 148, Bloomingdale-Van Buren 107.

## PENNSYLVANIA

APPROPRIATION of $125,000 for continuation of the research programs in oil and for the inauguration of a long-range study of basic problems in mineral industries is provided in a bill introduced at Harrisburg last week by Sen. T. B. Wilson of McKean County.

If enacted, the bill will insure continuation of the present studies in water-flood and air-gas recovery methods at State College.

The new petroleum project contemplated under Senator Wilson's bill is a basic study in the chemical constituents of Pennsylvania Grade crude which would permit the development of new products to provide additional support to the industry.

## LOUISIANA

LOUISIANA FIELDS will be permitted to produce 308,190 bbl. daily in March, an increase of 11,248 bbl. over February. The new order issued February 22 assigns most of the increase to South Louisiana fields which received a 9,414-bbl. boost to 236,722 bbl. North Louisiana fields were raised 1,834 bbl. to 69,468 bbl. daily.

## ARKANSAS

THE ARKANSAS LEGISLATURE has passed an enabling bill authorizing Arkansas to join the interstate oil compact. The bill was introduced first in the house by Rep. Jack Machen of Columbia County. Only the signature of Governor Atkins, who is out of the state, remains essential to make the bill a law.

NEXT STATE-WIDE hearing of the Arkansas Oil and Gas Commission will be held in Magnolia, March 21. It has been designated "Governor Adkins" day.

## WYOMING

THE SENATE last week rejected the bill that would have made the state a member of the interstate oil compact. Only two affirmative votes were cast for the measure in the senate. Opposition centered chiefly around alleged federal-government failure to encourage oil development in the state. Opponents feared the state's ratio of supplying the crude market would be frozen at its present position.

the OIL AND GAS JOURNAL

PRODUCING REFINING NATURAL GASOLINE PIPE LINE

Published weekly by The Petroleum Publishing Company at Tulsa, Oklahoma

# Refining Milepost

The announcement this month that four catalytic cracking plants would be constructed at widely scattered refining centers, is further evidence of a substantial nature that the chemical arts are rapidly becoming a major factor in this industry's manufacturing operations.

These units, costing millions of dollars, point to another highly important milepost which is to witness the general use of chemical aids in those primary refinery operations from which come the bulk of plant output. New standards in plant efficiency and quality of products are in the making.

This fact may answer those outside the refining industry who have asked why so much importance has been attached to recent announcements of new design in the applications of this development.

Briefly described, catalytic cracking involves the use of certain chemicals to accelerate and expand hydrocarbon reactions in the distillation of the heavier fractions of crude oil. For nearly six decades the industry's refinery processing consisted of skimming operations in which the principal products were separated out of the crude by a simple distillation operation comparable to the boiling of water in a teakettle.

This has been supplemented over the past quarter century by the several applications of high-temperature and high-pressure cracking operations involving the thermal decomposition of hydrocarbons in production of gasoline from gas oil and fuel oil. These operations account for better than a 50 per cent increase in gasoline yields.

In recent years, refiners have carried on widespread research covering the use of chemicals in facilitating several phases of plant practices. The first commercial operations were in the production of products from the lighter hydrocarbons which were made available largely as waste gas in the thermal cracking operations. These operations include polymerization, hydrogenation and other processes, in which chemicals are used to bring about a rearrangement of hydrocarbons to manufacture products which because of their unusual properties have premium values.

This development work applied to plants is responsible for 100-octane motor fuels, synthetic rubber, explosive materials and several new products.

Over the past 2 years, the industry's chemists working with metallurgists and those who perfected the high-pressure and high-temperature operations have gone on from the specialty operations to these principal distillation practices.

The outstanding motivation has been the production of still higher octane gasolines demanded by those who design engines for airplanes and motor vehicles.

Of greater industrial importance ultimately is the flexibility in plant operations which the widespread use of chemical syntheses in refining will give plant owners. Operations can be varied to meet the ups and downs in seasonal requirements for products.

The excessive storage of one product to meet the current demands for another which has plagued the industry for many years will not be necessary. January plant operations can be conducted on a basis of January needs and will not be controlled by the peak demands for gasoline the following July and August.

Petroleum refining has ceased to be a threshing machine for the separation of products at the end of a crude-oil pipe line. It is rapidly becoming a great manufacturing enterprise requiring the best in manpower and plant facilities.

Other industries have been revolutionized by similar developments in recent years. The industry's producers of raw materials, its economists and conservationists as well as its technicians need to watch closely this steady progress in manufacturing skill.

# Quality of A.I.M.E. Papers Offsets Restraint on Scope

By J. P. O'DONNELL

NEW YORK, Feb. 25.—Despite the effect of a self-imposed censorship that limited discussions on subjects of military value, the 1941 meeting of the A.I.M.E., Petroleum Division, was an outstanding success. This success was attributed to the high caliber of papers on technical and economic development which offset the curtailed foreign-production symposium.

It was announced that the Petroleum Division, which increased its membership 20 per cent during the past year, is now the institute's leading section in the point of membership. Eugene A. Stephenson, University of Kansas, took over the chairmanship of the division at its annual dinner, succeeding Terry V. Moore, Humble Oil & Refining Co.

Subjects ranging widely from the outlook for petroleum prospecting to trends in demand for petroleum products were discussed during the session on economics. This session was highlighted by a discussion of the system of free enterprise as it has affected both oil and the public the industry serves, presented by John D. Gill, director, Atlantic Refining Co.

### Tied to Economic Development

In his summary, Mr. Gill declared: "The validity of competition in the non-natural resource industries is established firmly on the rate and extent of the economic development of the United States." He then proceeded to demonstrate the nonexistence of any condition within the petroleum industry which would invalidate the principle of competition. He pointed to the benefits which competition has effected in the oil industry and the reasons why the practice of the competitive principle should continue to keep the industry virile and progressive.

Mr. Gill cited President Roosevelt's recent letter to Representative Cole regarding the "urgent need of federal legislation to safeguard our petroleum supply through prevention of waste and by establishment and maintenance of sound economic conditions" and Attorney General Jackson's statement that the oil industry constitutes a case "where the principle of conservation of an exhaustible and irreplaceable resource should replace the principle of competitive exploitation."

After presenting the supposition that the oil industry had been under a board similar to that proposed for the iron and steel industry from the outset, Mr. Gill illustrated the nature of such control and the status of production under it by asking a number of questions.

"How different would have been the history of the industry?" he asked. "What would be its present size and usefulness? Where would the board begin its task of finding oil? Would it be successful in disclosing first the most accessible reserves and thereafter always the most accessible? With that knowledge of the limitations of the total reserve at any assumed cost of production would the board plan its rate of depletion and allocate to the public the quantities which might be consumed annually? When would the board have begun to conserve the limited reserves of crude by searching for a process that might be called the "cracking process?" How rapidly would it develop the process and how far extend it with due consideration between the cost to produce oil and the cost of conversion of heavy fractions to gasoline?"

"A controlling bureau," Mr. Gill said, "appears most effective in providing regulation only when it attempts to regulate that which has been developed to a considerable extent and when hindsight can be brought into play as a basis for standardizing current practice. Even then its foresight is nil; it cannot foresee how the operation of the industry should proceed."

### Transportation Problems Reviewed

Eugene V. Holman, director, Standard Oil Co. of New Jersey, spoke at the dinner meeting on petroleum transportation in a world at war. "Under war conditions," Mr. Holman said, "oil-transportation problems at home and abroad are of a weighty nature; but the industry is fully aware of these problems and is adopting all practicable means to assure a satisfactory solution."

During 1940, 2,100,000,000 bbl. of crude oil were moved, first to the refineries and then, as products, to comparatively distant consuming markets, he said. Tankers are the most important factor in this accomplishment, and in war are subject to the most readjustment.

Mr. Holman estimated the world's tanker tonnage today at 17,600,000 deadweight tons, about one-sixth of all merchant vessels. He credited the United States and Great Britain each with 25 per cent, Norway with 20, Panama and the Netherlands a combined 10 per cent, and the Axis powers 10 per cent, with the remaining 10 per cent divided among 22 nations. Of the major countries only Great Britain, the United States, Italy and Japan are adequately supplied.

Germany, dependent for 75 per cent of her supplies upon tanker transportation before the war, has increased domestic synthetic production, but securing supplies from Rumania and Russia presents a real problem of transportation. Imports from Russia are believed to be small but increased quantities are expected to move from Rumania.

"Further, now that a free hand has been obtained in Rumania, two new pipe lines of 75 and 300 miles from the producing fields to the Danube are reported under construction. The longer of these lines will permit the bypassing of the Danube bottleneck, the treacherous Iron Gate, but construction status is somewhat in doubt and in any case considerable time will be required for completion. It is probable that 20,000,000 to 25,000,000 bbl. per year can be moved to Germany with some estimates running as high as 30,000,000 bbl. in any case it appears that Germany will be well on the way to removing the obstacles to transportation of most of the Rumanian production available after allowance for necessary consumption at home."

### Italian Supplies Limited

Italian supplies were said to be limited to stocks on hand. "Since the start of the Greek campaign, the small Albanian production of not more than 2,000,000 bbl. per year is in jeopardy." Mr. Holman said. Rail movements from Rumania have been introduced but such quantities have not exceeded 250,000 bbl. per month and are dependent on the extent to which Germany is willing to release oil to her partner.

Japan has a sizable tanker fleet characterized by comparatively high-speed design, which can take care of its normal import requirements of about 35,000,000 bbl. per year. If Japan were to become more actively belligerent, Mr. Holman said, its transportation problem would quickly take on an entirely different aspect. It is not expected that shipments from the Western Hemisphere would continue and there is considerable doubt that sufficiently strong convoys could be organized to protect movement from the Netherlands East Indies, even assuming that supplies could be obtained there."

Great Britain's pride in its merchant fleet is exceeded only by its dependence on it, he said.

### HIGHLIGHTS OF A.I.M.E. PETROLEUM DIVISION MEETING

**THE petroleum industry recognizes and is solving the transportation problems created by war and the threat of emergencies in other parts of the world. This conclusion was drawn from remarks by Eugene V. Holman, director of the Standard Oil Co. (New Jersey), who addressed members of the A.I.M.E. Petroleum Division at the close of the annual meeting in New York last week.**

**Abstracts of several papers were published in the February 20 issue of The Oil and Gas Journal. Others accompany this story and the International Page reviews some of the discussion at the foreign-production symposium.**

**Among highlights of the meeting and the discussions were:**

**Installation of John R. Suman, Houston, Tex., vice president and director of Humble Oil & Refining Co., as president of the general institute.**

**Discussion of practical application of the geodynamic and geochemical logging processes to oil and gas exploration.**

**Condemnation of federal-control efforts in light of the enviable record compiled under free competition.**

**Revelation that the petroleum division now has more members than any other in the A.I.M.E. group.**

**Citation of the Caribbean refineries as an augmented source of supply for residual fuel oil to meet any requirements that may arise.**

**Revaluation of stratigraphic traps as a source of future production.**

**Addition of natural gums and gelatinized starch to improve filtration characteristics of salt-water mud.**

**Induction of Eugene A. Stephenson, University of Kansas, as chairman of the petroleum division.**

**Declaration that Germany has greater petroleum resources than ordinarily conceded through synthesis and Rumanian imports.**

British tanker tonnage, added to that of its allies, approximates 8,700,000 deadweight tons, nearly one-half of the world total, even after allowing for sinkings of 800,000 tons, most of which has been British or British controlled. This capacity is handicapped by delayed repairs to damaged tankers, delays incident to the use of the convoy system and delays in discharging at destinations. "The inroads made by sinkings, damage and delay have so reduced the effective carrying capacity that the British tanker balance today must be comparatively close," Mr. Holman declared. One advantage is the ability to substitute closer sources such as the United States Gulf-Venezuela area for more distant sources such as Iran. "The extent to which this type of tonnage diversion has been made is not known," he said.

### Alternatives for Service

In the light of these increasing demands, Mr. Holman listed the following as means of maintaining a satisfactory tanker balance:

1. Construction of additional tankers. Under construction or on order now are 1,050,000 deadweight tons of modern tanker capacity, which, due to greater speed of the vessels, is equivalent to about 25 per cent of present capacity. Most of these ships are scheduled for 1941 and 1942 delivery.

2. Maintenance of old tankers in service through repair. Transportation capacity obtained this way is high in cost but very useful for covering marginal requirements.

3. Supplementing tanker movements with other forms of transportation. Against this are these costs: Tank vessel, 1.25 mills per ton-mile; pipe line, 3.2 mills, and rail, 8.3 mills. Improved pipeline technique for handling gasoline and other light products has expanded opportunities.

4. Substitution of shorter hauls. Under normal conditions there is a limited California-East Coast movement. Under tight conditions, Gulf-to-East Coast movement, only 40 per cent as long, can be and is substituted.

5. In smoothing out seasonal peaks, the best means is to employ otherwise idle tankers during the off season in increasing accumulation of crude and products at terminals to be drawn on in seasons of maximum demand. Several companies have announced intentions of increasing tankage capacity on the eastern seaboard this year.

The outlook for petroleum prospecting was discussed by E. De Golyer, who saw no reason for a change in the rate of discoveries but did expect a decline in geophysical work and with it a decline in structure discoveries. It seems we are about at the end of structure-finding techniques, Mr. De Golyer said, adding that the chief thing to look to is the search for stratigraphic traps.

This search has been most successful in California, he said, where an intelligent attack on the problem is undertaken through the study of surface geology, the mapping of outcrops and sampling of formations.

"We have passed the peak in the geophysical cycle," he continued, and described the outlook for the future as cloudy. Mr. De Golyer said there were 190 reflection crews in operation at the first of this year against 250 some 18 months earlier. He cited this as evidence of the decline. Much of the reflection work of late has been carried on in Mississippi, which has shown little profit from the prospecting viewpoint.

Mr. De Golyer made the observation that a continuation of the Dakota exploration, particularly in the heavily leased area in North Dakota, portends an interesting development for 1941.

Because of the possibility of a substantial increase in consumption, residual fuel oil is of great importance today, W. B. Case, Shell Oil Co., said in his paper on "The Role of Residual Fuel Oil in the Petroleum Industry." Mr. Case discussed the possibilities of what might happen should such an increase develop.

Present-day demand for residual fuel oil can be regarded as being composed of two parts, one, susceptible of being replaced by substitute fuels, and one not readily susceptible to replacement, the two being approximately equal parts of the total demand. The former includes gas and electric power plants and most industries, and the latter railroads, oil companies, ships and those who use it for heating. The inflexible use is closely related to general industrial conditions and the flexible use to price.

The attitude of the industry seems to have been that it would supply whatever quantities of heavy fuel it found necessary to make in supplying the markets for gasoline, kerosene and distillate fuels

*Eugene V. Holman, New York, director of Standard Oil Co. (New Jersey) told how the industry is meeting transportation requirements*

and that any demand for the product beyond that would have to be filled from supplies obtained from other sources which up to the present have always been available. This attitude on the part of the industry, Mr. Case said, coupled with the flexibility of half of the demand, the ever-present alternative of importing supplementary supplies and the normal functioning of price, has operated to keep supply and demand in balance.

Of six possible methods for balancing supply and demand cited by Mr. Case, that regarded as most likely is the bringing in of supplies from refineries in the Caribbean. "The cost of moving supplies from these refineries to the eastern seaboard for use in ships engaged in foreign trade is not prohibitive even with present tanker rates. Such a movement releases for domestic use an equivalent amount of the fuel: it may be expected that it will continue at a high level." Mr. Case denied the possibility of restriction of use, "The flexibility of the market and the free functioning of price will assure an adequate supply at a reasonable price to the inflexible consumers."

In a paper scheduled but not presented due to the author's illness, B. Orchard Lisle, consulting oil technologist, cautioned against underestimating Germany's self-sufficiency in liquid fuel. Mr. Lisle envisioned an increase of close to 60 per cent in Germany's supplies available from all sources in 1941, due principally to an anticipated gain in imports from Rumania and an increase in production of substitute fuels.

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# A.I.M.E. ABSTRACTS

**Geochemical Well Logging**

*Leo Horvitz, Subterrex*

SAMPLE collection, that is, taking well cuttings every 30 ft. normally, and sample analysis are described. Analysis is accomplished by low-temperature fractionation and combustion methods. Gas sample is separated into three fractions: (1) air, methane and hydrogen; (2) ethane, propane and butane; (3) pentane and heavier hydrocarbons.

Data show relationship between constituents and petroleum accumulations. In producing wells located toward edge of accumulation evolved-hydrogen patterns are often obtained in which maximum values appear some distance above the deposit, decreasing as deposit is approached. Nonproductive wells generally yield negligible traces of hydrogen.

**Geology of the Jennings Oil Field**

*M. T. Halbouty, Merit Oil Corp.*

THE most important geological feature of this field is the Vicksburg wedge which plays an important part in the limits of production and separates the northwest and the southwest flanks. The field contains many radial faults, faulting controlling the position of the sands and the possibilities of production.

Its successful development leads to the conclusion that stratigraphic pinchouts on lower beds will be found to be very prolific on other piercement-type salt domes. Production of the shallow 200-acre area since its discovery in 1902 to January 1, 1940, was 47,500,000 bbl., or 237,500 bbl. per acre. Flank production for 435 acres has totaled 26,138,000 bbl. since March 1929 while shallow production was 47,500,000 bbl. since 1902, a total of 73,650,000 bbl. for the field.

**New Developments in Cementing Practices**

*C. P. Parsons, Halliburton Oil Well Cementing Co.*

NUMEROUS mechanical devices have been introduced in order to eliminate guesswork in cementing and packer setting. They include:

1. Calipers for progressively measuring actual variations in the diameter of the hole.

2. The echometer which instantaneously determines the fluid levels which are necessary for proper control of balanced cementing jobs when plugging back in formations with high permeability and low fluid pressure.

3. Bulk cementing which eliminates the error due to waste when handling cement in sacks and makes possible accurate compounding of admixes with dry cement.

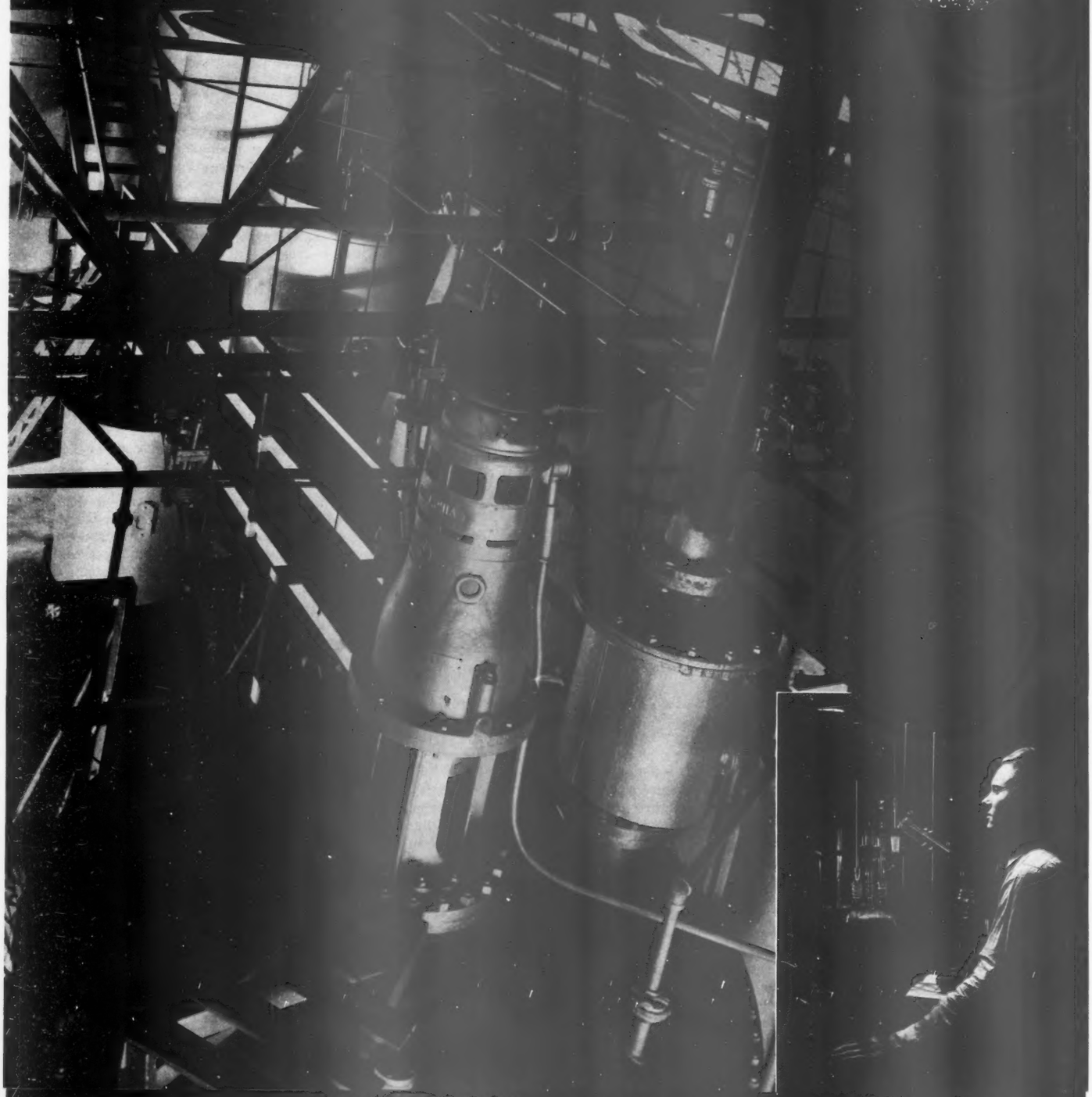
4. Synchronized pumps and mixers and the slurry meter which maintain a predetermined controlled slurry with a given water-cement ratio and unit volume.

5. The compressometer which measures the change in volume of drilling mud at atmospheric and at high pressure when used as a displacing fluid.

6. The dehydrator which provides an understanding of the changes in volume, plasticity and setting time of cement slurry imposed under high pressure against a permeable formation.

7. Admixture proportioners which feed definite amounts of various ingredients into cement instead of the handfeeding method.

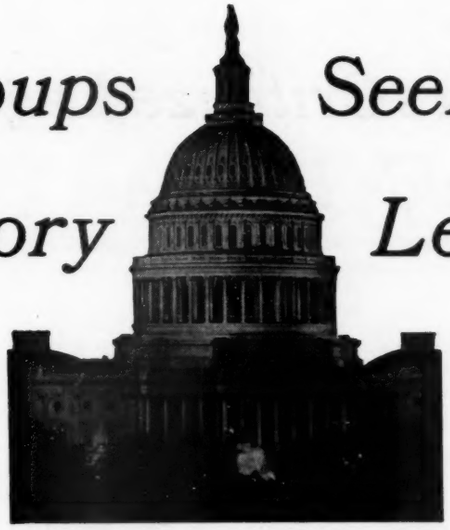
# VISCO



**VISCO PRODUCTS COMPANY,** *INCORPORATED* **· HOUSTON, TEXAS**

**NOTICE:** Visco Products Company is authorized to manufacture and sell Visco Oil Treating Compounds for use in the breaking and resolving of oil emulsions under the following United States patents: 1,860,562; 1,860,563; 1,912,330; 1,937,259; 2,050,639; 2,050,640; 2,214,783; 2,214,784; 2,206,589; 2,225,189. Re. 20,717 & patents pending. Any purchaser of Visco oil treating compounds is authorized to use the same in the treating, breaking and resolving of oil emulsions in accordance with the above patents. Visco Products Company is authorized to and is willing to grant licenses to oil companies under any and all of the above patents on royalty bases, permitting the producer to purchase the oil treating compounds at will from any vendor, and to prepare the compounds for use under the above patent or patents. Application for license should be made to **Visco Products Co.**, Houston, Texas.

# Several Groups Seek Expansion Of Regulatory Legislation



By HENRY D. RALPH

WASHINGTON, D. C., Feb. 25.—The great monopoly witch hunt, which so excited all industry 3 years ago when the Temporary National Economic Committee was launched by a special message from President Roosevelt, is now drawing to a close and the chief recommendations of the participating administrative agencies is that each one be given more money and a bigger staff to conduct bigger and better business investigations.

For the past couple of weeks the T.N.E.C. has been sitting to hear the proposals of its member agencies as to what sort of recommendations should go into its final report to Congress. So far nothing very startling, and certainly nothing new or novel, has been proposed. Various agencies have renewed recommendations for legislation which they have made publicly in the past, and most of them add up to more appropriations.

What the final report of the T.N.E.C. itself will be is, of course, unknown. Maybe the big, important proposals for federal control of business are being withheld from discussion to give the report more punch when it comes out in April. Maybe the six legislative members will have more radical ideas than their six administrative colleagues—which would be the reverse of the predictions 3 years ago. Present indications, however, are that the congressional members are none too pleased with the efforts of the administrative agencies to build up a case for giving them more appropriations, and that the T.N.E.C. will not recommend any drastic reforms of business which would interfere with the ability of American industry to function efficiently for defense production during the present national emergency.

These T.N.E.C. hearings have become the battleground for the old interdepartmental rivalry for the job of economic planning and superregulation of business which has been going on for several years among the Department of Justice, Federal Trade Commission, and Department of Commerce. Each wants the T.N.E.C. to urge Congress to give it the men and the money to keep industry on the straight and narrow path. Each outfit has its own ideas as to how this should be done, but they all have in common the conception of continuing investigation, interference and guidance. Ever since the N.R.A. folded up, each one of these agencies has hoped to inherit the job of running the nation's business, but to date Congress has not been much impressed with any of their suggestions.

### Arnold Pleads for Funds

Asst. Atty. Gen. Thurman Arnold, whose Antitrust Division has been more successful with the appropriations committee than the other two, made an impassioned plea to his T.N.E.C. colleagues for funds to start a lot of new antitrust cases immediately and to do some long-range planning and controlling of the way the Department of Justice thinks business should develop. The fines collected as penalties from business men found to be violating the law will repay the Treasury many fold for the initial cost of the campaign, he said.

In what he described as a long-run program of antitrust enforcement, Mr. Arnold asked for a corps of investigators to keep a constant watch over every sort of business. "In broad outline," he said, "we should have going all the time a number of systematic investigations, each covering a whole industry, and a number of smaller investigations of specific commodities which might be of minor importance in themselves but which would serve as traffic lights for a wide territory. A fully equipped antitrust division would also uncover a multitude of relatively small problems which should be examined from the point of view of their policing effect. It is hard to overemphasize the salutary effect over a wide field of a few current and typical cases moving through the courts. Men also ought to be available to follow up the decrees already obtained through the courts. The division should also have listening posts scattered throughout the country at strategic points. Finally, it should have a staff equipped to draft plans for the reorganization of business enterprises where such action is found to be necessary to prevent violations of the law."

### F.T.C. Seeks More Power

More investigation of business was also the main recommendation of the Federal Trade Commission, and it cited the oil industry as an example of how the government ought to keep a constant check on business. After asking for more money to expand its run-of-mine investigation and prosecution of specific complaints of unfair methods of competition, Chief Examiner Horton said:

"The commission, from time to time and as the necessity arises, could initiate investigations of certain industries which would be greatly in the interest of the public. I can refer specifically to the oil industry, which as we all know is impressed with a deep public interest. In our appearance before this committee on October 16, 1939, we presented at that time a series of problems with which the commission is confronted dealing particularly with the marketing and distribution of gasoline. The complaints relative to these practices are coming to the commission in unabated numbers, but owing to lack of funds and personnel, the commission cannot conduct a broad general investigation in order to ascertain the facts which would enable it to bring about a proper solution of these vital problems. The practices, while local to many communities, are usually part of a broad general plan and the solution cannot be accomplished by making sporadic local investigations at times throughout the United States.

"The most important consideration, however, that is presented in a broad investigation of this entire industry is that through such an investigation the Congress might be enabled to establish a definite national policy dealing with the production and distribution of oil and petroleum products in the light of national security and defense. The commission, being a creature of Congress, could be of very great assistance to Congress in the solution of such important questions, not only in this industry, but in numerous other industries upon which it may desire to establish a national policy expressed through appropriate legislation."

### Commerce Department Presents Plan

Something of the same nature, though more on the plane of research and farther removed from immediate threat of prosecution, was the proposal of the Department of Commerce, made through Under Secretary Wayne C. Taylor. The Bureau of Foreign and Domestic Commerce has no regulatory powers and is essentially a business research and service agency, but for several years it has been desirous of expanding its functions in the direction of an overall planning body to straighten out the ills of the economic system. A rather detailed plan for setting up a bureau of industrial economics was presented to Congress several years ago and rejected, and the proposal has come up several times since. Secretary Hopkins had ambitious ideas along this line and got appropriations to make a start, but the next year Congress cut off the funds.

Mr. Taylor's proposals to the T.N.E.C. were that his department be put in charge of a program of business and economic research to make a continuous investigation of what is wrong with business and to turn up information on which to formulate economic policy and to make "adjustments" in business structure and practices to keep the economy functioning at a high level.

In addition to these rival requests for money to keep a check on business, a number of specific proposals were made for legislation in certain fields. The Department of Justice asked repeal of the Miller-Tydings resale-price-maintenance law, asked that proposed mergers of business firms be submitted to it or some federal agency for approval before being consummated, renewed a series of recommendations for tightening up the patent laws to prevent monopolistic practices, and suggested a number of changes in antitrust procedure, including increases in civil and criminal penalties.

Recommendations of the Federal Trade Commission were all in the field of more authority and appropriations for the Federal Trade Commission, including power to control corporate mergers and power to serve as an adjunct of the courts in drafting and policing antitrust consent decrees. The Department of Commerce recommended that a new agency be set up to work with the states in eliminating local trade barriers to interstate commerce. The Patent Office also renewed a group of recommendations for amending the patent laws to provide speedier action on applications and to reduce the amount of patent litigation.

# Texas Operators Criticize Lag In Bureau's Crude Forecast

AUSTIN, Tex., Feb. 25.—Demand figures forecast by the Bureau of Mines will continue as the yardstick for setting Texas crude-oil allowables. This declaration was made by Commissioners Sadler and Culberson at a state-wide proration hearing here Monday. Mild criticisms were placed in the record by producers over the apparent lag of bureau-demand forecasts behind actual conditions.

Producers and the commission agree, it was indicated by remarks from the floor and bench, that the bureau's figures are reliable over a long range. The criticism was based on results in January when actual demand exceeded the bureau's forecast by 41,000 bbl. daily, according to Rex Baker, representing Humble Oil & Refining Co.

The hearing was conducted by Commissioners Sadler and Culberson who advised producers to register their complaints with the Bureau of Mines, suggesting this was the most direct method to bring forecasts in line with actual demand.

A preliminary summary of purchasers' nominations for March totaled 1,684,694 bbl. daily compared to a bureau forecast of 1,327,400 bbl.

Several purchasers, including Sun Oil Co., Magnolia Petroleum Co., Humble, Gulf Oil Corp., and Phillips Petroleum Co. requested higher allowables in certain fields. Emphasis was placed on demand for crudes with low cold test needed, purchasers said, in meeting requirements for lubricating oil.

Humble agreed to release connections on 2,000 bbl. of oil daily in the Panhandle for 60 days to Phillips, meeting a deficiency in the latter company's crude acquisitions that was described as acute.

Higher allowables were requested in several fields producing asphaltic-base crudes. These included the Talco and Cayuga fields in East Texas. Demand for asphalt-base crude is increasing sharply, purchasers said, to meet requirements in the defense program.

Gulf, one of the largest producing companies in West Texas, requested an increase of 15,000 bbl. in the daily allowable of 15 fields to which it is connected and from which it produces.

## Nowata Operators Plan Protest on Oologah Dam

Producers in the Nowata field, Oklahoma, and other sections of the Verdigris River valley will be represented at a public hearing which will be held by the War Department in Claremore, Okla., on Wednesday, March 5, beginning at 10 a.m., in the district courtroom, Rogers County Courthouse.

This hearing will be held to receive expressions from interests which may be affected by the construction of a dam at Oologah, Okla., for flood-control purposes. The project has been planned so that there will be a permanent recreation lake which will cover 3,000 acres except during flood seasons. The maximum area subject to inundation once in 25 to 58 years will include a large part of the Nowata field where oil recovery operations are conducted by water-flooding. As a result of engineering studies, U. S. Engineer Office, War Department, Tulsa, has determined that the dam is justified and should be built. It is the intention of the War Department to buy surface rights by negotiation or condemnation and to make arrangements with oil producers to compensate for the expense which will be incurred by them because of periodic floods which may inundate their properties.

## Taxation Discussed at February Mid-Continent Association Dinner

Ad valorem taxation, its history, development and application in Kansas and Oklahoma was discussed by speakers and in open forum at the February dinner meeting of petroleum tax representatives of the two states Friday, February 21, at the Tulsa Hotel in Tulsa.

Oklahoma taxes were discussed by an open forum led by Frank Orr, tax attorney for Sinclair Prairie Oil Co., Tulsa, after Leo Meyer, head of the tax department of Mid-Continent Petroleum Corp., traced the history of the tax in the state. Mr. Meyer drew on his experience, which dates back to the first state government of which he was named acting secretary, and to his service as the first elected state auditor. While he was auditor, Mr. Orr worked with him as clerk in charge of ad valorem taxatioon.

Orie Garnett, head of the taxation and research department of the Wichita Chamber of Commerce, spoke on ad valorem taxes in Kansas, and the open forum following his speech was led by Louis Potucek, Hartman-Blair, Inc., Wichita.

The group also elected a new tax-dinner program committee for 1941 to make arrangements for other meetings of the year. The new committee is made up of L. W. Bennett, Sunray Oil Co.; W. I. Hanson, Stanolind Oil & Gas Co.; Marshall Edwards, Skelly Oil Co., all of Tulsa; T. H. Marshall, Anderson-Prichard Oil Corp., Oklahoma City; T. W. Prentice, L. H. Wentz oil division, Ponca City, Okla.; Paul Bishop, Lauck Petroleum Corp., Wichita, Kans.; D. W. Watson, Stearns Drilling Co., Wichita; Mr. Potucek and W. K. Carr, Tulsa, secretary.

Nominating committee for the new program committee was Fay T. Anderson, Darby Petroleum Corp., Tulsa, chairman; W. Leo Austin, Mid-Continent Petroleum Corp., Tulsa, and J. C. Wallingford, Amerada Petroleum Corp., Tulsa.

## Wood River Refinery Making Large-Scale Test Runs

HARTFORD, Ill., Feb. 25.—Approximately 5,000 bbl. of crude are being charged to the units of the Wood River Refining Co.'s new plant located here. These runs are being made from large stocks of Illinois oil on hand but after this is exhausted the company will take Illinois and Mid-Continent crudes at the rate of approximately 8,300 bbl. per day. The proportion may vary. Connections have been made with the Ajax Pipe Line Co. system to supply this oil.

## Sustain Motion to Dismiss Treble-Damage Action

ST. LOUIS, Mo., Feb. 25.—U. S. District Judge J. C. Collett in the case of H. E. Miller Oil Co. v. Socony-Vacuum Oil Co. and six other defendants last week sustained the defendants' motion to dismiss the action.

The H. E. Miller Co. was a jobber conducting business in Missouri, and the filing of its suits initiated another so-called "jobber's suit" for treble damages following the defendants' conviction on price-fixing-conspiracy charges at Madison, Wis., in 1938. Also named in the complaint were Continental, Shell, Sinclair, Mid-Continent, Phillips, and Skelly.

The complaint as filed alleged that the defendants entered into a conspiracy to artificially raise and fix the tank-car price of gasoline sold in interstate commerce and that the plaintiff in purchasing gasoline at the raised prices had been damaged in the sum of $60,000.

### HOUSTON OIL WORLD EXPOSITION WILL BE HELD IN 1943

**HOUSTON, Tex., Feb. 25.—Directors of the Houston Oil World Exposition at their annual meeting here today changed the date of the Houston Oil Show from 1942 to the spring of 1943. All officers and directors were reelected. These included John R. Suman, president; J. C. Sutton, executive vice president; George A. Hill, Jr., J. S. Abercrombie, L. W. Childs and Wallace Wilson, vice presidents; W. B. Sharp, treasurer, and Ray L. Dudley, secretary.**

## DEATHS

**BREVARD S. LONG,** 45, Shell Oil Co., Inc., representative at San Antonio, Tex., died in a Dallas hospital February 18. Formerly, he had been stationed at Houston and Tyler offices of Shell

**GEORGE LEWIS KING,** 75, who retired 5 years ago as superintendent of the South Penn Oil Co., died of a heart attack February 17 at his home in Cameron, W. Va., where he had lived for 35 years.

**WALTER THOMAS BLISS,** 80, Bolivar, N. Y., attorney, who was linked to the Allegany field virtually since its discovery 60 years ago, died at Olean, N. Y., February 9. His uncle, the late Edwin S. Bliss was active in the promotion of the Richburg field "strike" in 1881. He leaves his wife and four sons.

**ROSCOE C. BROWN,** former superintendent of River Gas Co., Marietta, Ohio, died at his home in that city, February 11. A heart attack was the cause of death. Mr. Brown had retired from his position in 1938 because of his impaired health. Two daughters survive.

**JOHN A. BLACK,** 60, general manager of the Surety Oil Co., died at his home near Titusville, Pa., on February 16. He was previously employed by the Joseph Reid Gas Engine Co. as erecting engineer and was stationed for several years at the Reid plant at Marietta, Ohio. In 1911, he went to Burma, India, where he was associated with the Burma Oil Co. He leaves his widow and one daughter.

**GEORGE B. MILLER,** 65, employe of the Union Oil Co., died at his home in Los Angeles, Calif. A native of Venus, Venango, County, Pennsylvania, he was associated with the Phillips Oil Co. at Independence, Kans., and later resided at Columbus, Miss., before going to Los Angeles in 1926. He leaves his widow and a brother.

**THEODORE RAY MOORE,** 60, Bradford, Pa., oil producer, died February 17 after he collapsed on the Robert Roy, Sr., lease. He had just left his car and walked a short distance when he was stricken. Death was caused by a heart attack. He had served as superintendent of the Roy lease in West Branch for 18 years. He leaves his widow, two sons, and a daughter.

**FRANK W. MICHAUX,** 69, veteran driller who saw many of the important oil fields of the United States and Europe from a derrick floor, died February 19 at a Wichita Falls, Tex., hospital. He had drilled oil wells in Austria, Russia, Texas, Louisiana and California. His widow survives.

**WALTER M. HAIGLER,** 55, who had been associated with the King Oil Co., Wichita Falls, Tex., since 1929, died in a Wichita Falls hospital February 18. He had resided in Wichita Falls since 1907. He is survived by his wife.

**DANIEL M. HENNESSY,** 75, died in Waterbury, Conn., where he and Mrs. Hennessy had been vacationing. Mr. Hennessy was a Wichita, Kans., oil operator, and lived in Wichita for 32 years. Death was attributed to a heart ailment. In addition to his wife, he leaves a son and three daughters.

# International

## Argentina . .

### Mendoza Fields Promise Fast Production Climb

ABILITY of Argentina to meet its internal requirements for petroleum in 3 years was forecast last week by Glenn M. Ruby, formerly consulting geologist for Yacimientos Petroliferos Fiscales, the government oil company in that country.

Mr. Ruby spoke on Argentina's oil operations before the foreign-production symposium at the A.I.M.E. meeting in New York last week. His forecast of self-sufficiency was based mostly on the discovery of new fields such as those in the Province of Mendoza. Argentina now imports 14,000,000 to 15,000,000 bbl. of oil annually.

Considerable production is now shut in because of lack of pipe lines, he said, a condition which will be partially remedied if the proposed line from Mendoza to the Y.P.F. refinery at San Lorenzo on the Rio Parana is completed. He pointed out that Argentina is conserving its oil resources as much as possible by the importation of cheap English coal which is brought over in ballast.

The fact that the Comodoro Rivadavia area has been barely able to hold its own despite the constant use of 20 rigs was cited by Mr. Ruby. He said that geological conditions make discoveries difficult in the Patagonia area but predicted that the difficult Chaco area will produce oil, stating that it has "very great possibilities."

## Australia . .

### Obstacles to Australian Oil Exploration Modified

ACCEPTANCE of the Wade model bill has removed former obstacle to exploration in Australia. All states but New South Wales and Tasmania have accepted it, according to Arthur Wade's review presented at last week's foreign symposium before the A.I.M.E.

Shell and Superior Oil Co. took up acreage in Queensland and began work in 1940, Caltex acquired acreage in Kimberley district, Western Australia, and applied for land in Papua; Phoenix Oil Extraction Co. (Australian) is interested in southwestern Australia.

Shell is doing geological, geophysical and aerial survey work. Caltex has three geological parties and Superior Oil Co. of California is doing some work. Other companies are also at work but Oil Search subleased to Caltex in North West Cape in Western Australia but maintains holdings with Australasian Petroleum Co., a combination of Standard Oil Co. of New Jersey, Anglo-Iranian and Oil Search.

In Victoria six 1,200-1,500-ft. tests were dry, one of 4,004 ft. and one of 2,300 ft. In South Australia the Mount Gambier test at Merima Ridge in Kimberley district had gas shows at 3,200 and 3,220 ft. and is drilling at 3,300. In Queensland, Roma Blocks Oil Co., near Roma, had an oil show at 3,510 ft. and is drilling a fourth test.

No drilling is under way in New Guinea but Australasian Petroleum Corp. is conducting explorations and plans a test at Kariava, Vailala River and also a deep test in Papua. The Papuan Apinaipi Petroleum Co., Ltd., is drilling at 2,769 ft. at Oiapu near Cape Possession with shows of oil and gas.

## U. S. S. R. . .

### Production This Year Likely to Be Unchanged

CRUDE-OIL production of about 220,000,000 bbl. for 1941 in the U.S.S.R. is the outlook expressed in New York last week by Basil B. Zavoico, Chase bank, who reviewed operations there before the A.I.M.E., Petroleum Division, foreign symposium. The figure is unchanged from Mr. Zavoico's 1940 estimate. The U.S.S.R.'s growing domestic demand, he said, will probably reduce its exportable surplus this year adding that, currently, exports probably consist principally of lubricating oils. He expressed doubt of the success of the government plan to increase production to 342,000,000 bbl. in 1942, as called for in the 5-year plan.

Mr. Zavoico also mentioned the used of turbine and electric drilling rigs by Soviet trusts. Turbine rigs, operating at from 250 to 500 r.p.m., have made 50 ft. in an hour. He estimated that 20 are in operation. The principal criticism is their need for special bits. Electric rigs, operating at 400 to 500 r.p.m., are reported to be completely automatic. He also mentioned a revolutionary development in which rotary rigs are slanted in order to drill directionally under the Grozny overthrust. He listed among U.S.S.R. handicaps the lack of storage both in the fields and at refineries, loss in transportation and inadequacy of transportation.

## Germany . .

### Liquefied Gas Becomes Important Reich Fuel

DATA on German oil supplies are scarce, a Department of Commerce report states, since both production and import figures are considered a military secret. However, it was claimed officially in the fall of 1940 that Germany had greater stocks of motor fuel than at the outbreak of the war in September 1939, "when the Reich had very large stocks."

Considerable gasoline has been saved through the shift to liquefied gas and generator wood gas. The number of automotive vehicles using liquefied gas rose from 20,000 before the war to 60,000 in October 1940, and the number of wood-gas-generator equipped vehicles increased in the same period from 1,000 to 14,000. The shift to other fuels is claimed to have effected a saving of about 320,000 bbl. of gasoline per month.

Of greater importance is the expansion of synthetic gasoline production. Apart from the completion of a number of new plants and the enlargement of old ones, the formation of a new corporation was recently announced.

## Hungary . .

### Internal Crude Yield Nearly Meets Demand

HUNGARY is about to join Rumania and the U.S.S.R. as European countries which produce sufficient oil to meet internal requirements. This probability was advanced in New York last week by William P. Haynes, Standard Oil Co. (New Jersey) geologist, who presided at the A.I.M.E. symposium on foreign oil operations.

He reported principally on published data, but called attention to construction of a pipe line from the Lispe field in the southwestern part of Hungary to Budapest.

Trans-Atlantic dispatches last week reported disclosure before the Hungarian House of Deputies that Wintershal Kassel, German oil firm, has negotiated a 7-year contract with the government. The German firm obtains a monopoly on prospecting rights on 18,500 sq. km. (4,569,500 acres). The company was required to invest about $800,000 and to have capital of $1,500,000. Exports of oil are forbidden until internal needs are filled.

## Peru . .

### Peru's Production Reduced By Loss of Many Markets

PERU'S 1940 production of 12,127,135 bbl. was off 10 per cent from 1939 due to loss of markets as a result of the war. Principal production is from established fields: Zorritos, where 45 old and 15 new wells produce about 200 bbl. per day; Lobitos, where 1940 production was 2,435,504 bbl., off 10 per cent, and La Brea-Parinas, which produced 9,626,831 bbl. in 1940. The La Brea field had 123 new producers out of 139 completions, and 85 per cent of footage drilled was with rotaries. This summary is taken from a paper presented at the A.I.M.E. meeting in New York by O. B. Hopkins, chief geologist, Imperial Oil Co., Ltd.

The most successful of eight exploratory wells in La Brea-Parinas area opened the Rio Bravo pool north of previous wells by producing 1,072 bbl. daily at 2,375 ft. Currently a deep test is drilling at 9,200 ft. in Upper Cretaceous. There are 2,107 wells on production out of a total of 3,250.

Since no information is available, it is assumed that little activity is under way at Pirin in the Lake Titicaca area. Eastern Peru activity is confined to the Ganso Azul Co.'s Agua Caliente, northwest-southeast anticlinal structure near the Pachitea River which measures 15 miles long and 7 miles wide. Five wells have been drilled, three of them showing 350 bbl. and 250 bbl. daily production on ¼-in. choke and 120 bbl. per hour through 2-in. tubing. The last had 136 ft. of sand. The first two were bottomed at 1,175 ft. and 1,138 ft., respectively. The crude is 46° gravity, has little gas, is produced apparently by a hydrostatic pressure, and has an unexplainably high temperature of 165° F.

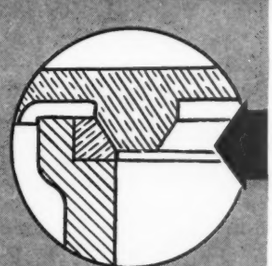
In Ecuador, International Petroleum and Anglo-Saxon are continuing exploration of 10,000,000 and 25,000,000-acre concessions.

# GAUGE COVERS for Atmospheric or Pressure Storage Tanks

S&J

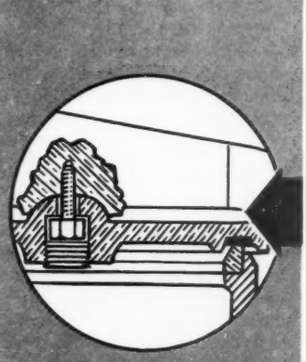
EVEN a casual comparison quickly indicates to the discerning engineer that there are gauge covers — and gauge covers. S. & J. Gauge Covers embody the same careful engineering and quality construction that is characteristic of far more costly equipment. They are available in a complete line for refinery and bulk storage tanks of all pressures.

**SHAND & JURS CO.**
BERKELEY, CALIFORNIA
NEW YORK HOUSTON LOS ANGELES CHICAGO



A brass seat ring, inserted in the cast iron or steel body, provides a gas tight and corrosion resistant seal. The drip ring carries rain water or condensate away from the seal.

S. & J. Gauge covers obviate explosion hazards by combining various metals which do not spark upon contact with each other. Four different combinations of cast iron, steel, lead and aluminum are available upon specification. Made in 4", 6", and 8" sizes with screw, angle or flat bases.



In this model, a composition ring inserted in the cover provides the ultimate in gas tight and non-sparking design. The spherical connection between the lever and cover assures uniform pressure between the base and cover at all points.

The clamp type spark proof gauge hole cover is recommended for pressure tanks. Bases are made of either cast iron or cast steel, with the insert seat, cover, lever and pedal of brass. Made in 4", 6", and 8" sizes with flanged or screw bases.

**SHAND & JURS**

# Natural Gasoline

## Operating-Kinks Session Will Feature Natural Gasoline Meeting in Dallas

THE twentieth annual convention of the Natural Gasoline Association of America, scheduled for April 23-25 at the Baker Hotel, Dallas, Tex., will again devote an entire day to the "operating kinks" session for field and plant men of the natural-gas industry, according to a recent announcement of William F .Lowe, secretary of the association.

Originally begun as an experiment to stimulate discussion of problems by operating men, this program feature has become one of the principal attractions of the convention for plant superintendents and field foremen as well as for engineers and executives. The session takes the form of a prize contest in which operating men compete with their original ideas for doing any job within their province in a better, cheaper, or safer way. The whole day of Friday, April 25, will be devoted to these discussions and a total of $165 is to be distributed in awards.

In supporting the suggestion to continue the contest again this year, George P. Bunn, Phillips Petroleum Co., president of the association, asserted that its value had increased every year since its inception. "This is true not only of the quality of the entries but in the presentation and discussion," he stated. "No finer opportunity has ever been given to field and plant men to demonstrate their ability to improve methods, tools and operations to the benefit of their companies and the industry as a whole. Natural-gasoline manufacturers will be well repaid by sending their plant and field men to Dallas for at least this portion of the convention program."

T. R. Goebel, Shell Oil Co., Inc., Houston, Tex., chairman of the program committee, expressed gratification that this session would be featured again this year. "This is the first time in many years that the N.G.A.A. annual convention has been held in Texas, and while field and plant men of Texas and Louisiana have entered their ideas in the contests in previous years, many of them have never had the opportunity to attend the interesting discussions which take place with their presentation. With the convention so conveniently located at Dallas, I'm sure that many of them will be there in person to take an active part in this portion of the program."

The operating ideas submitted are divided into four classes by the judges and prizes of $15, $10, $5, and $3 are awarded in each class for the outstanding entries. A grand prize of $25 is awarded for the most valuable offering in all classes. Judging is on a basis of practical application and need; labor, time and money-saving features; and originality. Almost all "kinks" are concerned with special tools, new or easier methods, safety devices, short-cut operations, unique applications, etc., and may apply in any one of the following classifications:

(*a*) Operation or maintenance of engines, compressors, boilers, turbines, electric motors or generators.

(*b*) Volumetric measurement, metering, temperature, pressure, volume or liquid-level controlling, laboratory equipment or methods, loading or handling of plant products.

(*c*) Distillation, fractionation, absorption, or treating of gas, gasoline or oil; general processing; storage of gasoline.

(*d*) Field operations, pipe line, general maintenance, accounting, and record keeping. Any other phase of the natural-gasoline industry not covered in the above classes.

The program committee consisting of Mr. Goebel, H. H. Beeson, Sabine Valley Gasoline Co., Inc., Shreveport; George E. Edgett, Carter Oil Co., Tulsa; H. A. Ells, Cities Service Oil Co., Bartlesville, Okla.; F. E. Fisher, Skelly Oil Co., Pawhuska, Okla.; R. D. Gibbs, Union Oil Co. of California, Los Angeles; and Allen T. Givens, Coltexo Corp., Monroe, La., has announced the following rules for submission of entries in this contest.

1. Any employe of a natural-gasoline manufacturer may submit one or more "operating kink" ideas.
2. Permission of the employer must be secured before any idea is submitted.
3. Each idea must be submitted in writing and two copies of each must be presented in the form designated on the "operating kink" blanks which may be secured from the Natural Gasoline Association of America, 923 Kennedy Building, Tulsa.
4. One clear drawing in ink, with clear lettering, or distinct photograph, or photostat should be submitted with each entry, though none of these should exceed 12 by 14 in. in size. Larger drawings are difficult to reduce for the making of lantern slides.
5. Not more than 5 minutes' time will be allotted for the explanation of any single entry.
6. The originator of the kink, although urged to do so, need not be present to explain his idea.
7. Prize awards are to be made by a committee of gasoline-plant operators, and their decisions will be final.
8. All "operating kink" entries should be in the N.G.A.A. offices by April 15, 1941, in order that the judges may have ample time to study and classify the entries before the meeting date.

# Refinery News

### Standard of Ohio to Build Acid Alkylation Plant

CLEVELAND, Ohio.—Standard Oil Co. of Ohio will start construction in June on a sulfuric acid alkylation plant for production of 100-octane aviation gasoline. Plans call for completion of the plant in November.

Arrangements have been made whereby Standard of Ohio will cooperate with the government aviation laboratory now under construction at the Cleveland airport. Under these arrangements, the company is installing small tanks for handling special fuel which can be used for testing purposes in the laboratory.

The sulfuric acid alkylation process is one of eight or more methods of producing 100-octane aviation gasoline. In this process, the olefin (usually $C_4$ fraction) is premixed with an excess of isobutane and this is fed to an emulsion of acid and reacted hydrocarbon which is rich in isoparaffin but essentially olefin-free. The actual reaction, according to S. H. McAllister, Shell Development Co., who described the process in The Oil and Gas Journal, November 28, 1940, is rather complicated and involves hydrogen transfer, isomerization and carbon-to-carbon cleavage, as well as alkylation. One of the outstanding advantages is that the process affords a method of obtaining a saturated product of high-octane number in a single step.

Alkylate obtained from the sulfuric acid process is blended with aviation naphtha and tetraethyl lead to produce the finished motor fuel. Standard of Ohio is now installing a delayed coking unit at the Toledo refinery which will permit use of the continuous process for coking reduced crude oil to replace the old process of batch coking in shell stills.

### Shell Awards Contract On Texas Butadiene Plant

HOUSTON, Tex.—Contract to build a butadiene plant at its refinery here was awarded last week by Shell Oil Co., Inc., to C. F. Braun Co., of Alhambra, Calif. Butadiene is the basic ingredient in one process for the manufacture of synthetic rubber from petroleum hydrocarbons.

The plant, scheduled to be completed and placed in operation this summer, is to have a capacity for producing 14 tons daily.

# Recycling News

### New Recycling Plant Being Built In Grapeland, Tex., Field

CROCKETT, Tex.—Geier Brothers and Jackson, owners of three producing wells and now drilling a fourth in semiproven portion of the Grapeland, Tex., distillate field, are building a recycling plant there. Hudson Engineering Co. of Houston, Tex., is in the early stages of construction on the plant.

Expenditure of $250,000 is involved on the plant which is to occupy a 30-acre tract in the north end of the D. A. Guice 100-acre farm, J. de J. Procella Survey, Houston County, Texas.

John L. Hill, formerly with Continental Oil Co., is the construction engineer.

### New Compressors Raise Capacity of Opelika Plant

Shamrock Oil & Gas Corp. and Lone Star Gasoline Co. are adding compressor capacity to the new recycling plant nearing completion at Opelika, Henderson County, Texas. Two 600-hp. units will increase the plant's gas throughput to 80,000,000 cu. ft. daily. The plant has been operating experimentally on low-pressure absorbers, but when fully completed, about April 1, tests will be made on absorption at pressures as high as 2,200 lb. per sq. in.

### Humble Confirms Plans for Recycling-Plant Construction

HOUSTON, Tex.—Humble Oil & Refining Co. has confirmed plans for construction of a recycling plan in the Katy field in southwestern Harris County, Texas, about 20 miles west of Houston. The plant will be one of the largest in Texas.

# Natural Gas

### Modification of Sweet-Gas Law Given More Study

AUSTIN, Tex.—A bill that would permit use of sweet gas in the Panhandle for production of carbon black was returned to a senate subcommittee for further study last week. The bill was introduced by Senator Hazlewood of Amarillo, Tex.

The measure proposes removal of restrictions against use of sweet gas by the carbon-black industry when it comes from a common reservoir producing both sweet and sour gas. Proponents contend this would limit application to the Panhandle.

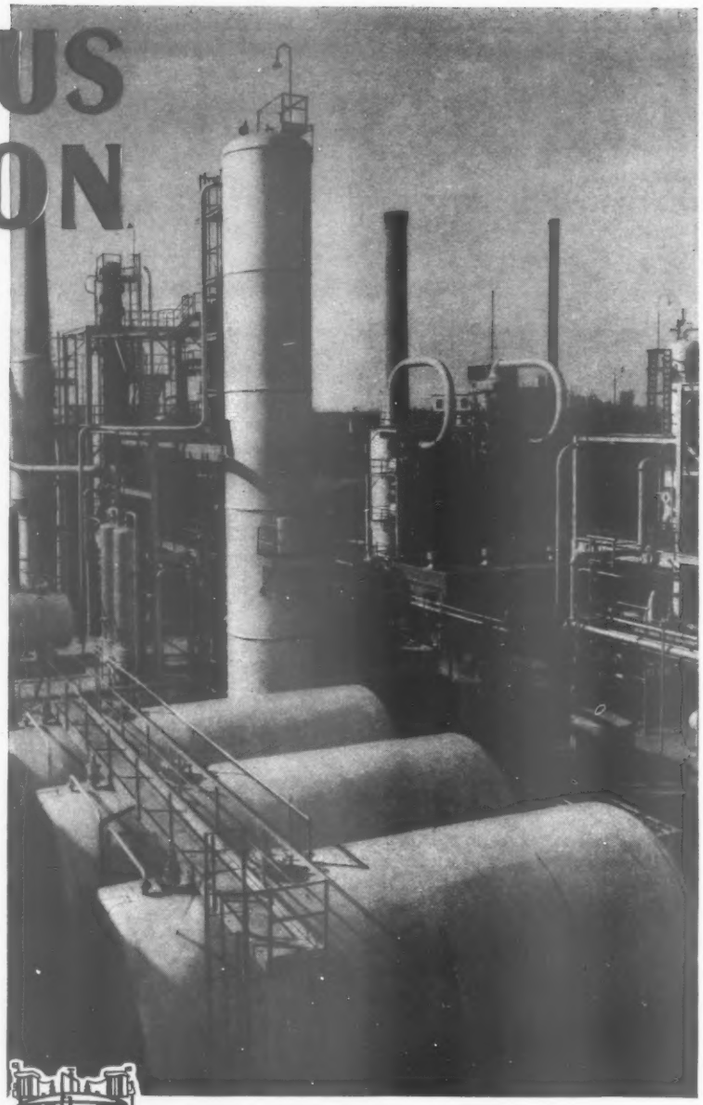
Sponsors of the bill claimed the present restrictions discriminate against certain wells in the Pampa area while opponents claimed sweet gas had sufficient markets without burning it for carbon black.

Senator Hill of Henderson said modification of Panhandle gas conservation would invite federal intervention.

### Sales Tax on Louisiana Gas to Have Court Test

A test suit has been filed in the East Baton Rouge District Court, Louisiana, by Hope Production Co. attacking the state's 1936 statute levying a tax of 1 per cent on all natural-gas sales. The suit will test the question whether natural gas produced in Louisiana and transported outside the state, can be taxed.

# CONTINUOUS OPERATION of REFINERY EQUIPMENT PAYS OFF



The increasing number of Petreco Electromatic de-salting plants being installed, and the performance records of these plants, proves conclusively that the protection afforded by this positive method of salt extraction does increase on-stream time.

By reducing shut-downs in many instances to only periodic inspections, the lost time due to corrosion, plugging, scaling and coking has been minimized. Operating and maintenance costs have been lowered while revenue has been increased. The pay-off is obvious.

Petreco engineering, research and laboratory facilities are available at all times to refiners having salt troubles. Inquiries involve no obligation, and are invited.

## PETRECO

**DE-SALTING** **DEHYDRATING**

*Single Unit Petreco Electromatic De-Salting Plant*

PETROLEUM RECTIFYING COMPANY OF CALIFORNIA

*General Offices:* 530 West Sixth Street, Los Angeles, California

*Gulf Coast Division*
1312 Petroleum Bldg., Houston, Texas

*Eastern Division*
648 Edison Bldg., Toledo, Ohio

*Representatives In Principal Oil Fields and Refining Centers*

# B. of M. Report Shows Gains Of 4 to 18 Per Cent for 1940

INCREASES, ranging from 4 per cent for lubricating oils to 18.5 per cent for gas oil and distillate fuels, are shown in domestic demand for petroleum in the preliminary 1940 figures issued last week by the Bureau of Mines. Total demand, including exports, increased for crude and all principal products, excepting lubricating oils and petroleum wax, which suffered declines of 1.2 and 2 per cent, respectively.

Total demand for crude averaged 3,745,000 bbl. daily, an increase of 2.7 per cent over 1939. Domestic requirements alone were 4.4 per cent higher in 1940 than in the preceding year.

## UNITED STATES SUPPLY AND DEMAND

1940 and 1939. (All figures in thousands of barrels)

### Crude Oil

| 12 months— | Total supply | Total demand | Excess Demand | Excess Pct. | Domestic production | Imports | Indicated domestic demand‡ | Exports | Stocks refinable crude Dec. 31§ |
|---|---|---|---|---|---|---|---|---|---|
| 1940 | 1,394,585 | 1,370,840 | 23,745 | 1.7 | 1,351,847 | 42,738 | 1,319,240 | 51,600 | 264,079 |
| Daily average | 3,810 | 3,745 | ..... | ... | 3,694 | 117 | 3,604 | 141 | ..... |
| 1939 | 1,298,057 | 1,335,138 | 37,081 | 2.8 | 1,264,962 | 33,095 | 1,263,062 | 72,076 | 239,978 |
| Daily average | 3,556 | 3,658 | ..... | ... | 3,466 | 91 | 3,460 | 197 | ..... |
| Increase, 1940 | 96,528 | 35,702 | ..... | ... | 86,885 | 9,643 | 56,178 | †20,476 | 24,101 |
| | 7.4% | 2.7% | ..... | ... | 6.9% | 29.1% | 4.4% | †28.4% | 10.0% |

### Refinery Products—Motor Fuel

| 12 months— | Total supply | Total demand | Excess Demand | Excess Pct. | Domestic production | Imports | Domestic demand | Exports | Stocks Dec. 31§ |
|---|---|---|---|---|---|---|---|---|---|
| 1940 | 616,456 | 614,531 | *1,925 | *0.3 | 616,359 | 97 | 589,424 | 25,107 | 83,647 |
| Daily average | 1,684 | 1,679 | ..... | ... | 1,684 | ..... | 1,610 | 69 | ..... |
| 1939 | 611,090 | 600,147 | *10,943 | *1.8 | 611,043 | 47 | 555,509 | 44,638 | 81,722 |
| Daily average | 1,674 | 1,644 | ..... | ... | 1,674 | ..... | 1,522 | 122 | ..... |
| Increase, 1940 | 5,366 | 14,384 | ..... | ... | 5,316 | 50 | 33,915 | †19,531 | 1,925 |
| | 0.9% | 2.4% | ..... | ... | 0.9% | 106.4% | 6.1% | †43.8% | 2.4% |

### Kerosene

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1940 | 74,086 | 72,150 | *1,936 | *2.7 | 73,882 | 204 | 68,776 | 3,374 | 9,512 |
| 1939 | 68,521 | 68,744 | 223 | 0.3 | 68,521 | ..... | 60,503 | 8,241 | 7,576 |
| Increase, 1940 | 5,565 | 3,406 | ..... | ... | 5,361 | ..... | 8,273 | †4,867 | 1,936 |
| | 8.1% | 5.0% | ..... | ... | 7.8% | ..... | 13.7% | †59.1% | 25.6% |

### Gas Oil and Residual Fuel Oil¶

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1940 | 531,313 | 535,352 | 4,039 | 0.8 | 499,522 | 31,791 | 500,103 | 35,249 | 132,244 |
| 1939 | 483,370 | 507,966 | 24,596 | 4.8 | 467,690 | 15,680 | 458,461 | 49,505 | 126,008 |
| Increase, 1940 | 47,943 | 27,386 | ..... | ... | 31,832 | 16,111 | 41,642 | †14,256 | 6,236 |
| | 9.9% | 5.4% | ..... | ... | 6.8% | 102.7% | 9.1% | †28.8% | 4.9% |

### Gas Oil and Distillate Fuels

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1940 | 186,637 | 183,620 | *3,017 | *1.6 | 183,304 | 3,333 | 164,448 | 19,172 | 42,940 |
| 1939 | 161,746 | 170,743 | 8,997 | 5.3 | 161,746 | ..... | 138,723 | 32,020 | 33,718 |
| Increase, 1940 | 24,891 | 12,877 | ..... | ... | 21,558 | ..... | 25,725 | †12,848 | 9,222 |
| | 15.4% | 7.5% | ..... | ... | 13.3% | .... | 18.5% | †40.1% | 27.4% |

### Residual Fuel Oils

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1940 | 344,676 | 351,732 | 7,056 | 2.0 | 316,218 | 28,458 | 335,655 | 16,077 | 89,304 |
| 1939 | 321,624 | 337,223 | 15,599 | 4.6 | 305,944 | 15,680 | 319,738 | 17,485 | 92,290 |
| Increase, 1940 | 23,052 | 14,509 | ..... | ... | 10,274 | 12,778 | 15,917 | †1,408 | †2,986 |
| | 7.2% | 4.3% | ..... | ... | 3.4% | 81.5% | 5.0% | †8.1% | †3.2% |

### Lubricating Oils

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1940 | 36,765 | 35,151 | *1,614 | *4.6 | 36,765 | ..... | 24,657 | 10,494 | 8,767 |
| 1939 | 35,036 | 35,594 | 558 | 1.6 | 35,036 | ..... | 23,713 | 11,881 | 7,142 |
| Increase, 1940 | 1,729 | †443 | ..... | ... | 1,729 | ..... | 944 | †1,387 | 1,625 |
| | 4.9% | †1.2% | ..... | ... | 4.9% | ..... | 4.0% | †11.7% | 22.8% |

### Petroleum Wax (Thousands of pounds)

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1940 | 596,342 | 546,718 | *49,624 | *9.1 | 513,240 | 83,102 | 356,653 | 190,065 | 125,272 |
| 1939 | 504,433 | 558,125 | 53,692 | 9.6 | 464,520 | 39,913 | 325,461 | 232,664 | 75,648 |
| Increase, 1940 | 91,909 | †11,407 | ..... | ... | 48,720 | 43,189 | 31,192 | †42,599 | 49,624 |
| | 18.2% | †2.0% | ..... | ... | 10.5% | 8.2% | 9.6% | †18.3% | 65.6% |

*Excess supply. †Decrease. ‡Crude only. §Includes finished and unfinished refinery gasoline and natural gasoline. ¶Gas oil and fuel oil equals gas oil and distillate fuels plus residual. Note: Total supply equals domestic production plus imports. Total demand equals domestic demand plus exports. Data on demand for refined products based on refinery shipments. ‖Does not include 11,906,000 bbl. of heavy oils in California. Comparable figure for December 31, 1939, 13,330,000.

### Crude Oil Run to Stills and Total All Oils

| 12 months— | Total imports§ | Total exports§ | Crude to stills | Per cent yield gasoline† | Natural gasoline production | Total supply all oils* | Total demand all oils* | Stocks all oils Dec. 31* |
|---|---|---|---|---|---|---|---|---|
| 1940 | 82,916 | 130,589 | 1,294,283 | 42.9 | 55,249 | 1,493,173 | 1,453,989 | 563,954 |
| Daily average | 227 | 357 | 3,536 | ... | 151 | 4,080 | 3,973 | ..... |
| 1939 | 59,060 | 188,959 | 1,237,840 | 44.9 | 51,650 | 1,378,170 | 1,420,035 | 525,838 |
| Daily average | 162 | 518 | 3,391 | ... | 142 | 3,776 | 3,891 | ..... |
| Increase, 1940 | 23,856 | †58,370 | 56,443 | ... | 3,599 | 115,003 | 33,954 | 38,116 |
| | 40.4% | †30.9% | 4.6% | ... | 7.0% | 8.3% | 2.4% | 7.2% |

*Total all oils includes crude and refined products, natural gasoline, and benzol. Stocks December 31, 1940, represented 142 days' supply, which compares to 135 days on the same date in 1939. †Decrease. ‡Does not include natural gasoline blended at refineries. §Includes crude oil and refinery products. In case of imports includes receipts in bond and for domestic use. All data based on Bureau of Mines reports.

Increased demand for gas oil and distillate fuel was the largest of any product from a percentage standpoint. Domestic requirements for this classification of fuels gained 18.5 per cent to a new peak of 164,448,000 bbl. for the year. Combined domestic demand for residuals, gas oil and distillate fuels increased 9.1 per cent. Motor-fuel requirements were 6.1 per cent greater in 1940, supporting forecasts made by petroleum economists as early as October 1939.

Exports of petroleum declined substantially. Losses of foreign business by products ranged from 8.1 per cent in residual fuel oil to 59.1 per cent for kerosene. The exports of motor fuel declined 43.8 per cent and shipments of all fuel oils heavier than kerosene slumped 28.8 per cent.

The swing in petroleum imports was one of the most significant developments of 1940. The bureau's 1940 figures show that crude imports increased 29.1 per cent to a daily average of 117,000 bbl. for the year. Fuel oils heavier than kerosene increased to 31,791,000 bbl., a gain of 102.7 per cent.

Total demand for all oils increased 2.4 per cent to 1,453,989,000 bbl. The aggregate supply of all oils gained 8.3 per cent, totaling 1,493,173,000 bbl. on January 1, 1941.

The summary of preliminary figures for 1940 is presented in the accompanying table.

A significant shift in the refinery operating trend was accented in December. The yield of gasoline continued to decline, the average for December being 43.1 per cent, compared to 43.4 per cent in November. The gas oil-distillate yield increased 0.8 per cent to 15.1 average and the residual yield 0.7 per cent to 25.5 per cent. The gains in yields of fuels were at the expense of asphalt and other products.

●

## Pennsylvania Considering Oil-Compact Membership

OIL CITY, Pa., Feb. 25.—Entrance of Pennsylvania into the interstate oil compact is being discussed by oil men of the state following request from western states that the matter be considered.

It is understood that Gov. Arthur H. James, of this state, has been approached on the matter, but he is not prepared to make any commitments until he has a more definite understanding of what membership would mean.

Few Pennsylvania oil men are prepared to make any decision until they have had more time to make a full study of the subject and what it would mean to this state.

## THE MARKETS*

CRUDE OIL: The buoyancy under the crude market, particularly in the middle western states, appears to be increasing. There have been changes in posted prices this week but purchasers are displaying a more vigorous interest in new connections than has been witnessed in the Mid-Continent and other producing areas for several years.

REFINERY: Improved conditions on the Gulf Coast resulted this week in an advance of 0.25 cent on most grades of gasoline. The motor-fuel market displays new vitality in the Middle West and along the eastern seaboard. Distillate-fuel-oil prices are soft in most sources of important supplies. Prices for light burning oils slumped 0.2 cent per gallon at a few New York terminals.

TANK WAGON AND POSTED DEALER: Trends in the dealer market followed much the same lines established at the refineries. Kerosene prices were reduced along with light fuel oils in several eastern states. Zero temperatures in parts of the northern and eastern sections of the country imparted a temporary stimulant to distillate fuel oils but they are soft generally. Scattered changes in the gasoline tank-wagon market were mostly upward.

FINANCIAL: Oil securities rallied slightly at the close after touching a new low for recent weeks. Average of 30 representative stocks for the week ended February 22: High, 22.31; low, 21.75; close, 22.07. Week ended February 15: High, 22.90; low, 21.84; close, 21.94.

*Detailed information in the Market Section.

# *a New* CLARK

# 3,000 H.P. in 1

# RK Development

## CLARK *STEAM-DRIVEN* "ANGLE" COMPRESSOR

**Sizes up to 4,000 H. P.**

In response to a request by the Union Oil Company of California, for a large-capacity CLARK "Angle" Compressor with steam drive — Clark recently designed and built two 3,000 H. P. "Angle" units — one of which is shown at left.

These two units, equal to a battery of ten 6-cylinder, 600 H. P. CLARK gas-driven "Angles", — are being installed in Union's refinery at Oleum, California, along with three 8-cylinder CLARK gas-driven "Angles" equipped with our new supercharged power cylinders and developing 1,000 H. P. per unit.

The new CLARK Steam-Driven "Angle" is equipped with Unaflow steam cylinders, noted for economical operation. The particular features of this compressor are small floor space requirements, low foundation and building costs, economical steam rates, flexibility, and minimum maintenance costs due to the smallness of the parts. Tests indicate this unit will set new records in its field for low first cost, low maintenance, and low operating cost per horsepower. It is available in sizes from 600 to 4,000 H. P. Get in touch with our nearest office for complete information.

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Export Offices: 30 Rockefeller Plaza, New York. Domestic Sales Offices and Warehouses: Tulsa, Okla.; Houston, Texas; Chicago, Ill.; Boston, Mass. (131 Clarendon St.) West Coast Offices: Smith-Booth-Usher Co., Los Angeles, Cal. Foreign Offices: 72 Turnmill St., E. C. 1, London; 4 Str. General Poetas, Bucharest, Roumania

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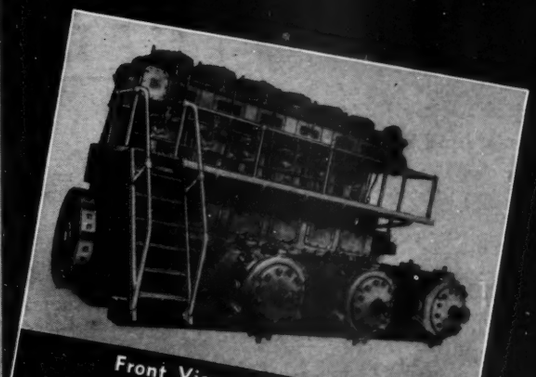
Van der Horst Corporation of America.
Porous Chrome Hardening for engine parts.



Front View — 3,000 H. P. Steam Driven "Angle"

Side View — 3,000 H. P. Steam Driven "Angle"

# CLARK

# COMPRESSOR UNIT

# PROGRAMS AND MEETINGS

### Northeast Oklahoma A.P.I. Group Will Meet in Tulsa

Officers of the Northeast Oklahoma chapter, American Petroleum Institute, last week voted to hold the first public meeting of the reorganized organization at the Mayo Hotel, Tulsa, March 3.

In addition to a short business program, with H. W. Ladd, chairman, and O. E. McClatchey, vice chairman, in charge, a timely sound picture will be shown.

### American Chemical Society National Meeting in St. Louis, April 7-11

Scheduled for the 101st national meeting of the American Chemical Society, which will be held in St. Louis, Mo., April 7-11, are 14 special symposia, in addition to hundreds of scientific papers to be presented before 17 of the society's 18 professional divisions. Several addresses by leading scientists will be delivered at a general session on Monday, April 7, the opening day of the meeting in the St. Louis Municipal Auditorium. Dr. William Lloyd Evans, of Ohio State University, will preside.

The division of petroleum chemistry, which is celebrating the twentieth anniversary of its founding, will stress "Analytical Methods Used in the Petroleum Industry."

The chemists will hold a banquet on April 9 at the Hotel Jefferson, which has been designated as headquarters of the meeting. An elaborate social program is planned and numerous inspection trips are being arranged.

### Illinois Basin A.P.I. Will Meet in Mount Vernon

The Illinois basin chapter of the A.P.I. will hold its monthly meeting at Mount Vernon, Ill., the evening of March 7. A dinner will precede the technical session, at which L. F. Livingston, E. I. Du Pont de Nemours Co., will present a paper on the manufacture and use of plastics. A movie, "A New World Through Chemistry," will also be shown.

Bart DeLaat, engineer for Pure Oil Co., Olney, is chairman of the Illinois chapter and Jake Haas of Adams Oil & Gas Co., Centralia, is program chairman.

### Sharp Gain in Octane Predicted by Chemist

WICHITA, Kans., Feb. 25.—A prediction that regular-grade motor fuel will have 85 to 90 octane number of 1945 was made here last Saturday by William H. Hubner, refinery technologist of the Ethyl Gasoline Corp., Detroit, Mich. Mr. Hubner addressed the Wichita section of the American Chemical Society.

"An increase of 25 per cent in fuel economy," said Mr. Hubner, "is one of the possibilities, for future advances will be utilized to give greater fuel economy as well as improved performance."

Improvement in design to take advantage of the higher quality fuels, Mr. Hubner believes, will permit much higher compression ratios than now employed. Several references were made to compression ratios of 10.3 to 1, which Mr. Hubner said required a fuel above 100 octane number in experimental operations. Fuel of 95 octane number was said to be suitable for compression ratios of 8.0 to 1.

### Illinois Independent Producers Will Gather at Centralia

The second annual dinner meeting of the Independent Oil Producers Association of Illinois will be held at the Langenfeld Hotel at Centralia, Tuesday, March 4. The Centralia Chamber of Commerce is underwriting the expense of the dinner, which will be free to members and guests of the organization.

Dr. A. H. Bell, head of the oil and gas division of the state Geological Survey, will be the principal speaker. His subject will be "The Progress of Illinois Development."

The taxation and legislative committees of the association have completed a study and review of the current situation in Illinois, which will be presented at the meeting. Association officers will be elected at the meeting.

## CALENDAR

### February

AMERICAN PETROLEUM INSTITUTE, southwestern district regular spring meeting, Washington-Youree Hotel, Shreveport, La., February 27-28.

### March

NORTH TEXAS OIL AND GAS ASSOCIATION. Wichita Falls, Tex., March 1.

AMERICAN SOCIETY FOR TESTING MATERIALS, Hotel Mayflower, Washington, D. C., March 3-7.

OHIO PETROLEUM MARKETERS ASSOCIATION, Deshler-Wallick Hotel, Columbus, Ohio, March 4-6.

PACIFIC COAST GAS ASSOCIATION, annual spring sales conference, sales and advertising section, San Francisco, Calif., March 6-7.

AMERICAN PETROLEUM INSTITUTE, Illinois Basin chapter, Mount Vernon, Ill., March 7.

NATIONAL DIXIE DISTRIBUTORS, INC., Fort Worth, Tex., March 10.

AMERICAN PETROLEUM INSTITUTE, Pacific Coast District, Division of Production, regular spring meeting, Biltmore Hotel, Los Angeles, Calif., March 11.

INDIANA INDEPENDENT PETROLEUM ASSOCIATION, spring convention and refiners' and suppliers' exhibit, Hotel Severin, Indianapolis, Ind., March 11-13.

SOCIETY OF AUTOMOTIVE ENGINEERS, national aeronautics meeting, Washington Hotel, Washington, D. C., March 13-14.

OKLAHOMA UTILITIES ASSOCIATION, annual meeting, Tulsa, March 17-18.

OIL BURNER INSTITUTE'S NATIONAL OIL BURNER PROGRESS EXHIBITION, Commercial Museum, Philadelphia, Pa., March 17-22.

MID-CONTINENT CHAPTER, AMERICAN PETROLEUM INSTITUTE, spring convention, Herring Hotel, Amarillo, Tex., March 21-22.

OIL TRADES ASSOCIATION OF NEW YORK, annual meeting, Waldorf-Astoria Hotel, New York, March 25.

PACIFIC COAST GAS ASSOCIATION, annual spring technical conference, technical session, Los Angeles, Calif., March 27-28.

### April

AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS, twenty-sixth annual meeting, Rice Hotel, Houston, Tex., April 2, 3, and 4.

AMERICAN CHEMICAL SOCIETY, St. Louis, Mo., April 7-11.

MIDWEST POWER CONFERENCE, fourth annual meeting, Palmer House, Chicago, April 9-10.

PERMIAN BASIN ASSOCIATION, third annual convention, Lubbock, Tex., April 14.

SOUTHWESTERN GAS MEASUREMENT SHORT COURSE, College of Engineering, Oklahoma, University, Norman, Okla., April 15-17.

WESTERN PETROLEUM REFINERS ASSOCIATION, annual meeting, Arlington Hotel, Hot Springs, Ark., April 16-18.

### North Texas Gathering Will Bring Several Lawmakers to Wichita Falls

Acceptances have been received from a number of members of the Texas Legislature who have been invited to attend the annual meeting of the North Texas Oil and Gas Association which will be held in Wichita Falls, March 1.

Two state officials will be the principal speakers. Speaker of the House Homer Leonard will address the luncheon gathering at noon in the Wichita Club, and Lt. Gov. Coke Stevenson will be the headliner at the evening banquet in the Woman's Forum.

Newly elected officers and directors, including C. J. Tucker, the incoming president, will be installed at the evening banquet.

### Illinois Geologists Hear Paper On Illinois Ordovician

More than 100 members of the Illinois Geological Society met at Olney, Ill., February 21, to hear a paper on "The Ordovician of Illinois," by J. Marvin Weller and L. E. Workman of the Illinois Geological Survey. Attention has recently been centered on the deeper horizons by the discovery of Trenton production at Salem and the discussion following the paper was mainly directed at correlating the older beds of rock.

Les Clark, Shell Oil Co., Inc., Centralia, is president of the society and Robert G. Kurtz, Ohio Oil Co., Marshall, Ill., is secretary and treasurer. C. B. Anderson, program chairman, presided at the meeting. The next meeting will be held on March 14 with acidization being the subject of the talk.

### Set March 8 as Date of Big Oil Banquet

The executive board of the Panhandle Producers and Royalty Owners Association met last week and set Saturday, March 8, as the date for the annual business meeting and banquet. The former will be held at noon, at a luncheon at the Amarillo Hotel, and the afternoon and evening activities will be at the Herring Hotel.

### Kansas Governor Will Address Oklahoma Accountants

Gov. Payne Ratner, of Kansas, will address the Petroleum Accountants Society of Oklahoma at their executive-night dinner meeting, which will be held at the Crystal Ballroom, Mayo Hotel, Tulsa, Thursday night, February 27, at 7 p.m.

Governor Ratner's subject will be "An Oil Detour on Emergency Street."

He will be accompanied from Topeka by Andrew F. Schoeppel, chairman of the Kansas Corporation Commission, and Walter Fees, Republican state chairman.

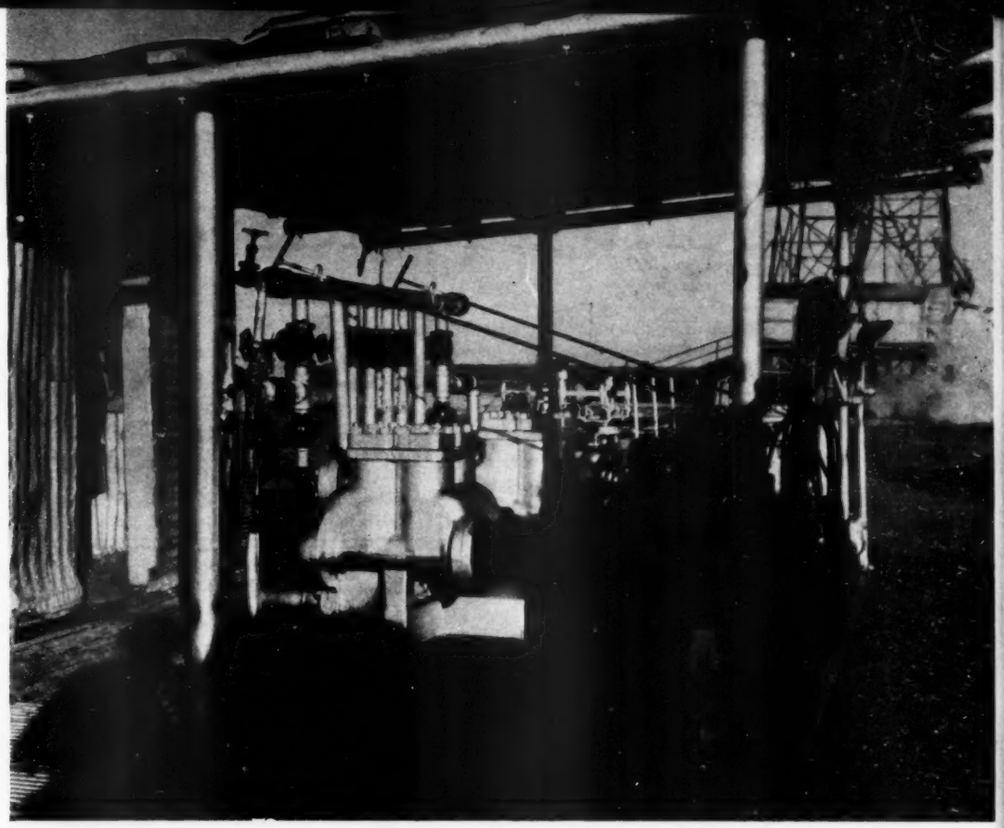
At one meeting each year the society holds a special meeting to entertain the executives and other guests of the 73 companies represented by the 174 members.

### Tristate Oil Men to Meet in Evansville, Ind.

EVANSVILLE, Ind.—Preparations are being made here for a meeting of the oil men from Illinois, Indiana, and Kentucky on Friday, February 28. The meeting will be preceded by a dinner at 7 p.m.

Speaker for the evening will be Russel B. Brown, chief counsel for the Independent Petroleum Association of America, who will talk on "The National Picture as It Affects the Oil Industry."

The meeting is not being sponsored by any particular group but is a cooperative effort of all the oil men and associations in the three states. A. R. Thompson, independent of Mattoon, Ill., and a director of the I.P.A.A., is chairman of the meeting.



*To reduce rigging-up and dismantling time and increase the facility with which drilling rigs may be transported, oil companies and drilling contractors continually devise means by which various pieces of equipment may be unitized. On its steam-rotary rigs one company follows the same unitizing arrangement and layout at each rig in West Texas. Here is shown its method of unitizing boiler-charging pumps and auxiliary equipment, complete with walkways made from sucker rods, at a rig in the Seminole field of Gaines County*

# ENGINEERING & OPERATION

## In This Section

FEBRUARY 27, 1941


**RECENT TRENDS AND SUCCESS OF PLUG-BACK WORK IN EAST TEXAS**
By W. H. Wiginton ..... Page 64

Water production of East Texas field wells is increasing steadily, as salt water continues to encroach from the west, thereby requiring that many wells be plugged back. Here is given a complete discussion of newer method used in plug-back work to shut off salt water, showing past results of various methods employed and outlining economies of this type of remedial work.

**PREVENTION OF CORROSION OF STEEL PIPE LINES BY OIL-WELL BRINES**
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Use of sodium silicate in brine-disposal systems as a means of preventing corrosion of steel pipe lines is discussed. Tests show only little silicate is required to give a high degree of protection.

**OCCURRENCE AND TREATMENT OF HEAVING SHALE** ..... Page 76

Heaving shale is one of the most troublesome drilling problems encountered in some Gulf Coast fields, often requiring the expenditure of huge sums of money to overcome it. The three principal routes of attack on this problem, through control of mud properties, are dealt with; namely, a minimum water loss, a minimum of base exchange and a high specific gravity.

**APPRAISAL OF STEELS FOR HIGH-TEMPERATURE REFINERY SERVICE**
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In an application of steel for high-temperature service, creep strength is only one of the properties which must be considered. The steel must also possess the desired degree of surface stability (resistance to oxidation and corrosion), structural stability, and the ability to retain suitable physical properties under the combined influence of time, temperature, and stress.

**OPERATING IDEAS** ..... Page 71

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# Recent Trends and Success of Plugback Work in E. Texas

By W. H. WIGINTON
The Atlantic Refining Co., Longview, Tex.

**A.P.I.—Presented before East Texas chapter of American Petroleum Institute's Division of Production at Kilgore, Tex., on February 18, 1941.**

As the daily water production is increasing steadily, much discussion is being carried on as to the economics of controlling the salt water produced in the East Texas field.

A sketch of the East Texas field, Fig. 1, shows —3,320 line on base of Woodbine sand. It is estimated that the original water level was —3,320 and that portion of the field west of the —3,320 line originally was underlain by salt water. The shaded area in Fig. 1 shows where serious water encroachment already has been encountered in producing wells. The map alone shows why the shutting off of salt water is a problem of utmost importance. Fig. 2 is an electrical log showing the exact oil-water-contact point of a well in the S. Harrell Survey in Upshur County. Logs of this nature are needed to furnish data to operators as to the water level of the field.

The purpose of this paper is to discuss briefly the older methods and give a more complete discussion of the newer methods used in plugback work to shut off salt water, showing past results of various methods that have been employed and outlining the economics of this type of remedial work.

The cost of a majority of the workovers in the past has been entirely too high to justify the work; therefore, the various operators have demanded that less expensive methods be developed whereby salt-water production can be profitably curtailed.

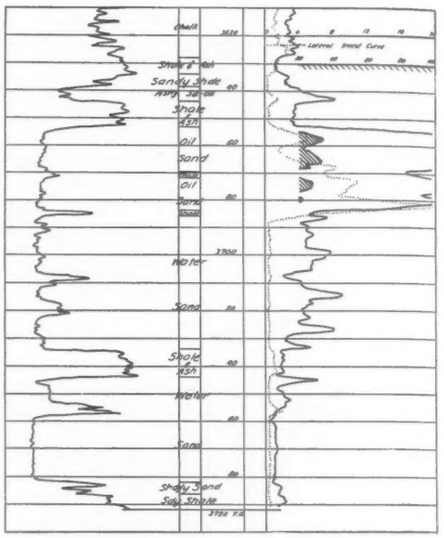


*Fig. 2—Electrical log of Woodbine formation of a well in S. Harrell Survey, Upshur County, East Texas field*

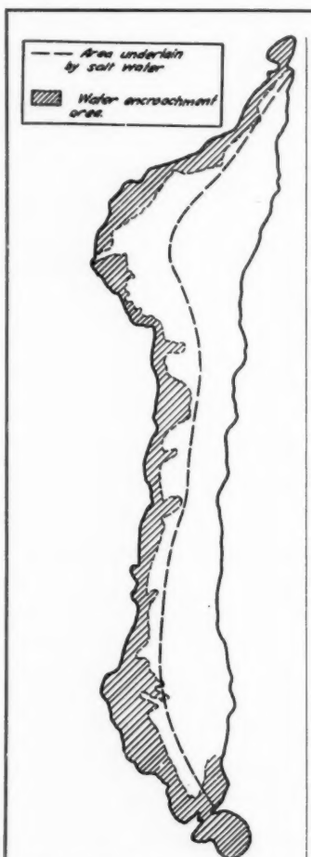


*Fig. 1—Serious water encroachment area and original area underlain by salt water, East Texas field*

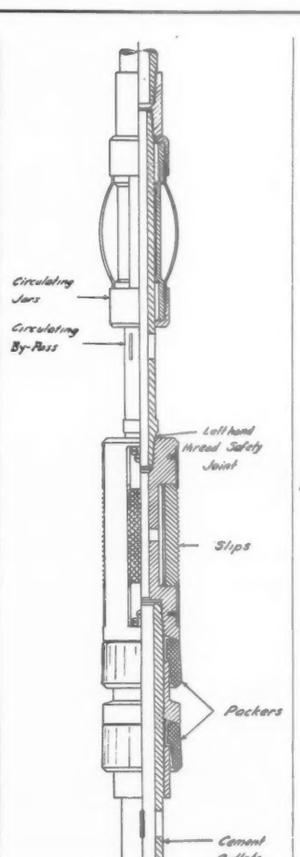


*Fig. 3—Removable cementing tool*

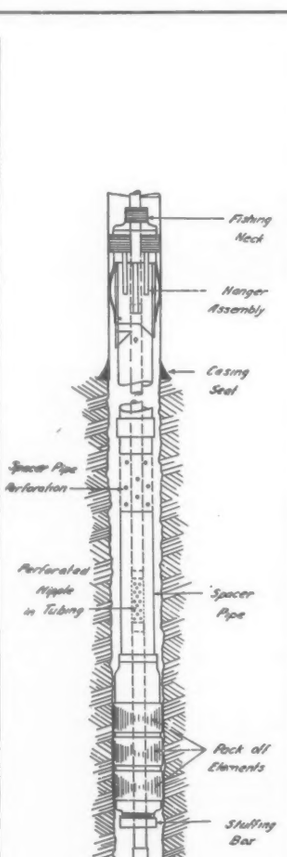


*Fig. 4—Formation packer*

The older methods in use are:

1. Dump bailer.
2. Displacement.
3. Braden-head squeeze.
4. Short-string squeeze.
5. Retainer squeeze.

Note: Any type tool that retains pressure on the formation while the cement is setting is hereinafter referred to as "retainer."

### 1. Dump-Bailer Method

This method is one of the oldest in use in plugback work. The required amount of cement slurry is mixed by hand and placed in the bailer. The bailer is lowered to the bottom of the well on a sand line. The bottom of the bailer is opened mechanically through a trip assembly after total depth of the hole is reached, thus the cement is discharged. The procedure is repeated until a predetermined point, obtained from a driller's log or an electrical log, is reached. After a period necessary for the cement to set has elapsed, the well may be tested. Several successful plugback jobs have been done by this method—mainly in wells making a small percentage of salt water, and immediately after the water entered the bore of the well. The shutoff of salt water by this method is shown to have less permanence than other methods in use.

### 2. Displacement Method

If the cement plug is cut off below the top of the oil sand by this method, it is necessary to know definitely where the top of the oil sand is located, which is obtained from the core record or electrical log. The tubing is placed a few inches off of bottom of the well. The cement is mixed and pumped into the tubing. This cement slurry is followed up with a measured amount of fluid necessary to equalize the cement in the

bottom of the well. The tubing is then raised and the cement plug is cut off at the desired point below the top of the oil sand, washing the excess cement out of the well. Usually the tubing is raised to a point in the casing, and after the cement plug has set the tubing is placed near bottom and the well swabbed in.

This same method can be used where the top of the cement plug is cut off up in the casing. After the setting time has elapsed, the well is drilled in, preferably with cable tools. Where a well is completed originally through perforations and later water enters the casing of the well through the perforated zone, it is possible to place a cement plug in and above the perforations by this method. In some parts of the field the column of water above the cement plug exerts enough hydrostatic pressure to force the cement into the formation, therefore making this type of job a complete failure.

### 3. Braden-Head Squeeze Method

On this type job, where the top of the cement plug is cut off below the top of the oil sand, it also is necessary to know the exact depth of the top of the oil sand. The cement is mixed and equalized, and the excess cement is washed out, in the same manner as in the displacement method. The tubing is raised in the casing and pressure from 500 to 1,000 lb. per sq. in. is placed on the well. With the well closed in, this allows the cement to set under pressure.

If the top of the cement plug is cut off up in the casing, the following procedure is used: An amount of cement is run and equalized in the bottom of the well to fill up from the total depth of the well to usually 100 ft. up in the casing. The bottom of the tubing is raised approximately 60 ft. up in the casing and the cement above this point is washed out. The casing is closed in, and by a measurement of the fluid pumped, it is possible to determine how much cement is being placed in the formation and where the top of the plug should be at all times. Usually from 10 to 20 ft. of cement is left in the bottom of the casing when the squeezing ceases. The casing is closed in and the cement sets under pressure. The well is drilled in with cable tools after the setting time has elapsed. It is possible to shut off salt water that has entered a well through perforations by this method.

The cement may continue to move into the formation after the squeezing has ceased, because of the pressure exerted by the column of fluid, resulting in an unsuccessful job. There is a possibility of damaging the light-weight casing that is in use in this field by applying the pressure necessary in some instances to place the cement into the formation.

### 4. Short-String Squeeze Method

This method is used where a well has a large amount of open hole, to cement off a caving formation, or where the operator desires to drill the well deeper.

If the well is drilled deeper, the following procedure is used: Drill pipe and mud preferably are used. After the amount of desired hole is drilled, an electrical log is run to locate the shale breaks and the oil-water contact. The hole is underreamed, if the operator elects, from the casing seat to a point approximately 10 ft. from the bottom of the hole. This leaves a rathole, thus keeping the liner away from the walls of the hole at the oil-water contact point. The inserted liner, having anchor shoe with back-pressure valve on the bottom and packer assembly with hold-down slips on top is run to the bottom of the hole on either tubing or drill pipe. Cement is then pumped through the lowering-in string. After unscrewing from the setting tool, the packer is collapsed by allowing the weight of the drill pipe or tubing to rest upon it. This also sets the slips which prevent the liner from moving up the hole while pressure is applied. The cement is squeezed into the formation with no pressure on the casing. When the back-pressure valve closes, the wash pipe is lifted up and the excess cement is washed out. The liner is then perforated and the well swabbed in.

### 5. Retainer Squeeze Method

A cement retainer consists of a neoprene packing element with upper and lower slips and a back-pressure valve, all constructed of drillable material. The retainer is connected to tubing or drill pipe with a circulating joint. The circulating joint is connected to the retainer with left-handed threads. After the retainer is set, the formation is "broken down" by pumping 10 to 20 bbl. of water into the formation. A 14 to 16-lb. cement slurry is mixed and pumped into the formation. When the desired amount of cement is placed in the formation, the circulating joint is backed off in the left-hand threads, the excess cement is washed out, and the circulating joint and tubing or drill pipe are removed from the well. The back-pressure valve allows the cement to set under pressure. If the back-pressure valve fails to close, in most instances only a small amount of cement flows back.

The types of plugback work being done with the use of the retainer are: Squeezing formation in open hole, with or without the use of tail pipe, squeezing through perforations or where a full-hole cementer has been used and used as a bridge plug between two perforated zones.

The more recent methods in use are:

A. Removable cementing tools.

B. Formation packers.

C. Bridge plug or hook-wall packer between perforated zones.

### A. Removable Cementing Tool

A new removable cementing tool offered by several service companies consists of cups and slips with a bypass joint on top of the tool. Upon application of hydraulic pressure the cups expand, thereby keeping the pressure off the casing. The slips are necessary to hold the tool and tubing or drill pipe in the hole while the pressure is on the formation. After the required amount of cement is placed in the formation, the tool is released, the excess cement is washed out by reverse circulation, and pulled out of the well. No appreciable amount of cement returns after the tool is released if the final pressure obtained is from 1,800 to 3,000 lb. per sq. in. on the pump. Fig. 3 shows one of the removable cementing tools used in the field.

The common practice of operators in the field in high-pressure squeeze jobs is to mix 250 sacks of cement for open-hole squeezing and from 25 to 50 sacks for squeezing through perforations.

Formation in open hole may be squeezed with the tool set in the casing and if desirable, when the formation has caved, tail pipe can be used. Thus far, it has not been proven whether the cement plug can be cut off below the top of the oil sand and the well swabbed in without some necessary drilling.

Squeezing the formation through perforations to shut off bottom-hole water or fresh water can be accomplished with the tool. After the pressure is applied and the tool released, all excess cement is washed out of the casing by reversing the circulation. This procedure eliminates the necessity of drilling out the cement plug. Also, the tool can be used to wash behind perforations. By the use of a removable tool, it is possible to squeeze a formation through a perforated zone and produce from the top of the same zone without drilling or reperforating.

If measurements are incorrect, the tool can be reset indefinitely until the correct location is decided upon.

The first plugback job that was done with this tool was on July 12, 1940. Up to January 25, 1941, 34 squeeze jobs to shut off salt water and 12 jobs to test pipe and shut off fresh water had been completed. One operator has completed eight jobs to retard salt water with the tool, with all the jobs being 100 per cent successful.

The opinion of some operators is that the cement plug cracks when the well is drilled in with cable tools after a high-pressure squeeze job, either using a retainer or a removable cementing tool. The results of 38 jobs which were studied show the above thought to be untrue. In 37 of the jobs the tool sidetracked the original hole. A depth of 12 ft. was drilled below 5½-in. casing in a 9⅞-in. hole in the other well without leaving the original hole. It was necessary to perforate a zone at the bottom of the casing to bring the well in.

### B. Formation Packer

A formation packer has been developed to provide an adjustable and removable packoff between an upper and lower producing formation, where it may be impossible to predetermine exactly the most effective packoff point. Some of the factors affecting the most desirable location of the packer which may be difficult and expensive to determine, are:

The absence or presence of a definite shale break and its definite location.

The size of hole below the casing seat.

The condition of the well bore in regard to caves, washes, etc.

By means of the formation packer, the packoff point can be adjusted to give the most effective shutoff.

Should the neoprene packing elements be injured while being lowered in the hole, or if sloughing has occurred so that the tool cannot reach the desired depth, the packer can be removed from the hole either before or after testing.

Fig. 4 shows a sketch of a formation packer which has been used in the field to shut off salt water.

A formation packer of the hook-wall type re-

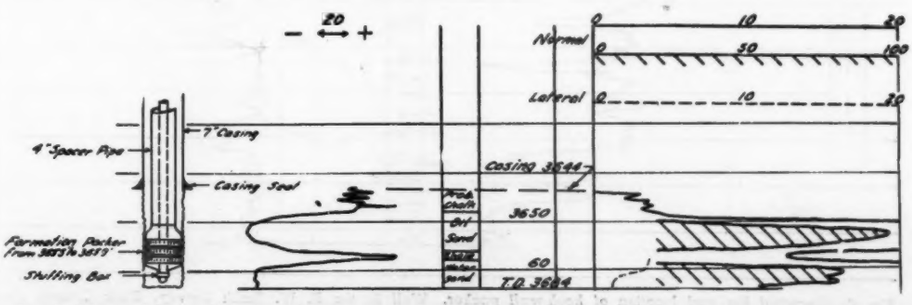


*Fig. 5—Electrical log and location of formation packer. Well in the Cordova Survey, Rusk County East Texas field*

cently used consists of a hanger assembly that includes a mandrel and slips which are set in the casing, a lower packing assembly consisting of neoprene elements, three elements each 16 in. long usually being used; and a lower stuffing-box assembly which allows movement of the pipe running through the packing assembly for setting the packer. The two sections are joined together and spaced apart by spacer pipe (usually 4-in. line pipe, where there is 7-in. casing in the well). It is necessary to perforate the spacer pipe and install a perforated nipple in the tubing string to allow fluid passage. A minimum of 12 ft. of hole below the casing is necessary to efficiently complete the setting of this formation packer. A 6¼-in. hole below 7-in. casing is an ideal condition for this method of remedial work.

These packers have been set in formation where the electrical log showed no shale break and a complete water shutoff obtained. By the addition of a second stuffing box in the spacer pipe and a packoff element on the hanger assembly, one operator shut off a casing leak and bottom-hole water in one of his wells.

Fig. 5 shows an electrical log and sketch of the location of a formation packer used to shut off salt water in a well in the F. Cordova Survey in Rusk County. The well had been pumping for approximately 2 years and producing 70 per cent b.s. and w. The formation packer was set on June 11, 1940, and the pump and rods were left out of the well. The well is flowing and continues to produce pipe-line oil.

A formation packer was set on February 24, 1940, in a well in the Cordova Survey. The well was producing 40 per cent b.s. and w., and at the present continues to produce pipe-line oil.

Approximately 25 formation packers have been set in the field, 20 being successful in shutting off salt water. One operator has set 10 of the packers with 8 of the jobs resulting in a complete shutoff of salt water. On the two jobs that were failures, an attempt was made to reset the formation packers at a higher point. When the packers were removed from the well, the packoff elements were torn off of the mandrels and found to be in the bore of the well where the first attempt was made to set them. It was necessary to use a hydrostatic bailer with junk catcher attached, to recover the torn elements from the well. The water was later shut off in these wells, using a removable cementing tool to place the cement in the formation.

**TABLE 1**

| Type of job— | Average cost |
|---|---|
| A. Dump bailer (no electrical log run) | $400.00 to $650.00 |
| B. Displacement: | |
| 1. Plug cut off below top of oil sand | 625.00 |
| 2. Plug cut off up in casing | 975.00 |
| 3. Plug cut off in casing and reperforate casing (no electrical log run) | 550.00 |
| C. Braden-head squeeze: | |
| 1. Plug cut off below top of oil sand | 675.00 |
| 2. Plug cut off up in casing | 1,025.00 |
| 3. Plug cut off in casing and reperforate casing (no electrical log run) | 600.00 |
| D. Short-string squeeze: | |
| 1. Well drilled deeper with rotary tools, liner perforated | 2,750.00 |
| 2. Using rotary but no drilling or underreaming, liner perforated | 2,250.00 |
| 3. Using tubing and service truck, liner perforated | 1,550.00 |
| E. Retainer squeeze: | |
| 1. Open hole—well drilled in with cable tools | 1,850.00 to 2,050.00 |
| 2. Through perforations—reperforating (no electrical log run) | 1,135.00 |
| F. Removable-tool squeeze: | |
| 1. Open hole—well drilled in with cable tools | 1,450.00 |
| 2. Through perforations—reperforating (no electrical log run) | 950.00 |
| G. Formation packer | 850.00 to 950.00 |
| H. Plugs set between perforated zones: | |
| 1. Tools used as bridge plugs (no electrical log run) | 575.00 |
| 2. Use of hook-wall packers—reperforate (no electrical log run) | 475.00 |

**TABLE 2**

| Type of job— | Number | Successful | Remarks— |
|---|---|---|---|
| **OPERATOR A** | | | |
| Dump bailer | 29 | 19 | |
| Braden-head squeeze | 5 | 3 | |
| Retainer squeeze | 9 | 6 | |
| **OPERATOR B** | | | |
| Displacement | 17 | 10 | The wells were producing from 40 per cent to 98 per cent water. With the exception of the retainer jobs, the cement was mixed by hand. |
| Braden-head squeeze | 1 | 0 | |
| Retainer squeeze | 8 | 1 | |
| Dump bailer | 1 | 0 | |
| **OPERATOR C** | | | |
| Braden-head squeeze | 2 | 2 | |
| Short-string squeeze | 6 | 5 | Later shut off channel by retainer method. |
| Retainer squeeze | 38 | 36 | One well making 99 per cent water, plugged and abandoned. After 3 years, one well producing 20 per cent b.s. and w. |
| Removable-tool squeeze | 8 | 8 | |
| Formation packers | 10 | 8 | Rubber was torn while passing through casing shoe on one well. Formation caved on one well. |
| Hook-wall packers set between perforations | 8 | 7 | Water channeled in one well and it was shut off later by retainer method. |
| **OPERATOR D** | | | |
| Braden-head squeeze | 12 | 8 | |
| Retainer squeeze | 3 | 3 | |
| **OPERATOR E** | | | |
| Braden-head squeeze | 27 | 21 | |
| Retainer squeeze | 3 | 1 | Two of the wells were plugged and abandoned. |
| **OPERATOR F** | | | |
| Displacement | 25 | 7 | |
| Retainer squeeze | 12 | 6 | |
| **OPERATOR G** | | | |
| Retainer squeeze | 50 | 38 | A large number of these wells were producing 60 per cent to 80 per cent water. |
| **OPERATOR H** | | | |
| Retainer squeeze | 16 | 14 | These jobs are for one district only. |
| Braden-head squeeze | 15 | 7 | |

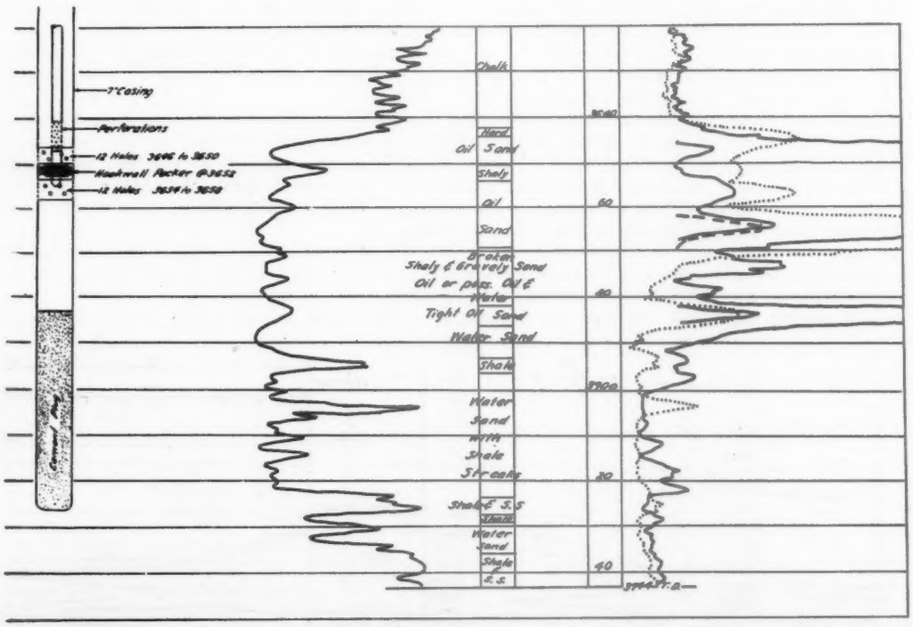


*Fig. 6—Electrical log and location of hook-wall packer. Well in the R. W. Smith Survey, Rusk County, East Texas field*

### C. Bridge Plugs or Hook-Wall Packers Between Perforated Zones

This method is used where the oil string is set through the sand section and the original completion of the well is through perforations. After water starts to enter the well, a higher zone is perforated and some type of bridging plug or hook-wall packer set between the two perforated zones.

Fig. 6 shows an electrical log and location of hook-wall packer in a well in the R. W. Smith Survey in Rusk County. The hook-wall packer was installed in June 1938, and the well continues to produce pipe-line oil. The presence of a major shale break increases the chances of a successful shutoff of the salt water.

A complete shutoff should be obtained, after the installation of a plug between two perforated zones, provided the original cement job prevents the water from channeling behind the casing. In the event of several perforated zones, the use of the hook-wall packer allows the operator to determine the exact point of water encroachment.

From an economical standpoint, the use of the hook-wall packer with bottom plugged and a perforated nipple placed above the packer is desirable, as the packer may be removed and used

**TABLE 3**

| Period— | No. of jobs | Braden-head squeeze, high-pressure squeeze, and short-string squeeze | Displacement jobs |
|---|---|---|---|
| From January 1933, to March 30, 1937 | 325 | 35% | 65% |
| From March 30, 1937, to December 6, 1938 | 300 | 85% | 15% |
| From December 6, 1938, to January 8, 1940 | 201 | 92% | 8% |
| From January 8, 1940, to January 15, 1941 | 119 | 95% | 5% |
| | 945 | | |
| From January 8, 1940, to January 15, 1941 | | Displacement plugbacks | 5% |
| | | Braden-head squeeze | 14% |
| | | High-pressure squeeze | 71% |
| | | Short-string squeeze | 10% |

again; therefore, the casing is free from obstructions.

One operator in the field has attempted several jobs to retard salt water by the chemical-plug method. One of the jobs obtained a complete shutoff of the salt water, while another one was partly successful. It is estimated that the chemical was forced as far as 20 ft. into the formation. Much study is being given to this method, and it may prove to be effective in the future.

Several months ago one operator plugged back a well by the short-string squeeze method, with an added feature of metal baskets expanding against the formation to retard the upward and downward pressure. The well continues to produce pipe-line oil.

The average cost of various methods being used to shut off water in the East Texas field is shown in Table 1.

The approximate number, and success, of various types of jobs ended April 15, 1940, or later, of several operators are shown in Table 2.

Seventy-four retainer squeeze jobs were completed during a 9-month period ended March 31, 1940. The results were:

57 jobs, or 77 per cent, successful

17 jobs, or 23 per cent, failures

Wells producing 50 per cent or more of salt water were 68 per cent successful, while wells yielding 50 per cent or less of salt water were 93 per cent successful.

The trend of operators' opinions on the method of cementing in plugback work is shown in Table 3.

A detailed record of available information, showing the trend in 1940 towards high-pressure squeeze cementing is shown in Table 4.

Investigations disclose that the operators who plugged back immediately after water entered a well, thereby preventing the sand section from becoming contaminated, obtained more permanent shutoffs, also a greater percentage of success.

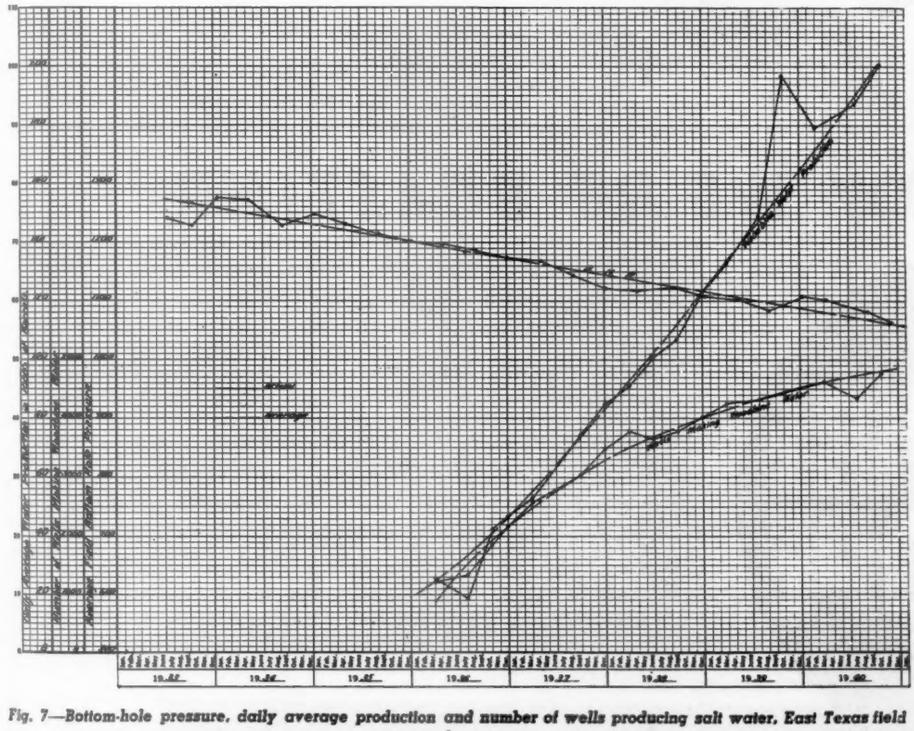

*Fig. 7—Bottom-hole pressure, daily average production and number of wells producing salt water, East Texas field*

The plugback method to be used should be governed by the manner of original completion and by local sand conditions in the well.

The major considerations in deciding on remedial work in the field, are:

1. Location of the well.
2. Amount of oil-bearing sand, free of water.
3. Percentage of, and length of time the well has been producing water.
4. Ultimate life of well and possible payout.

Fig. 7 shows the direct relationship between reservoir pressure and the daily water production and the steady increase of the number of wells producing salt water in the East Texas field. Data for the curves were obtained from the records of the Texas Railroad Commission.

## Economics of Remedial Work

There is possible damage to reservoir energy and a probability of decrease in ultimate recovery resulting from the production of water with oil. The items which increase the lifting cost by the production of water with oil are:

1. Treating of emulsions.
2. Pumping larger quantities of gross fluid.
3. Salt-water disposal.
   (*a*) Disposal plants.
   (*b*) Impervious storage pits.
4. Corrosive action on equipment.
5. Possible damages from pollution.
6. In event of gas lift—more gas required.

Investments necessary in the production of salt water are:

1. Artificial lifting or larger pumping equipment.
2. Treating-plant equipment.
3. Salt-water-disposal plants.
4. Impervious storage pits.

In determining whether remedial work can be done profitably, the length of time the well will be free from water after the plugback must be considered, along with the two intangible factors of preserving the reservoir energy and protecting the surrounding wells, bearing in mind that the production of a barrel of water from the reservoir may have the same effect on reservoir energy as the production of a barrel of oil.

## Acknowledgment

The author wishes to acknowledge the contributions of B. E. Moir, division superintendent of the Atlantic Refining Co.; W. S. Morris, of the East Texas Engineering Association, and R. J. Dobson, of the Shell Oil Co., Inc., and several operators; also to Messrs. Major and Holland, of the Atlantic Refining Co., for their assistance in preparing the sketches and curves. I also wish to thank the Atlantic Refining Co. for permission to present this paper.

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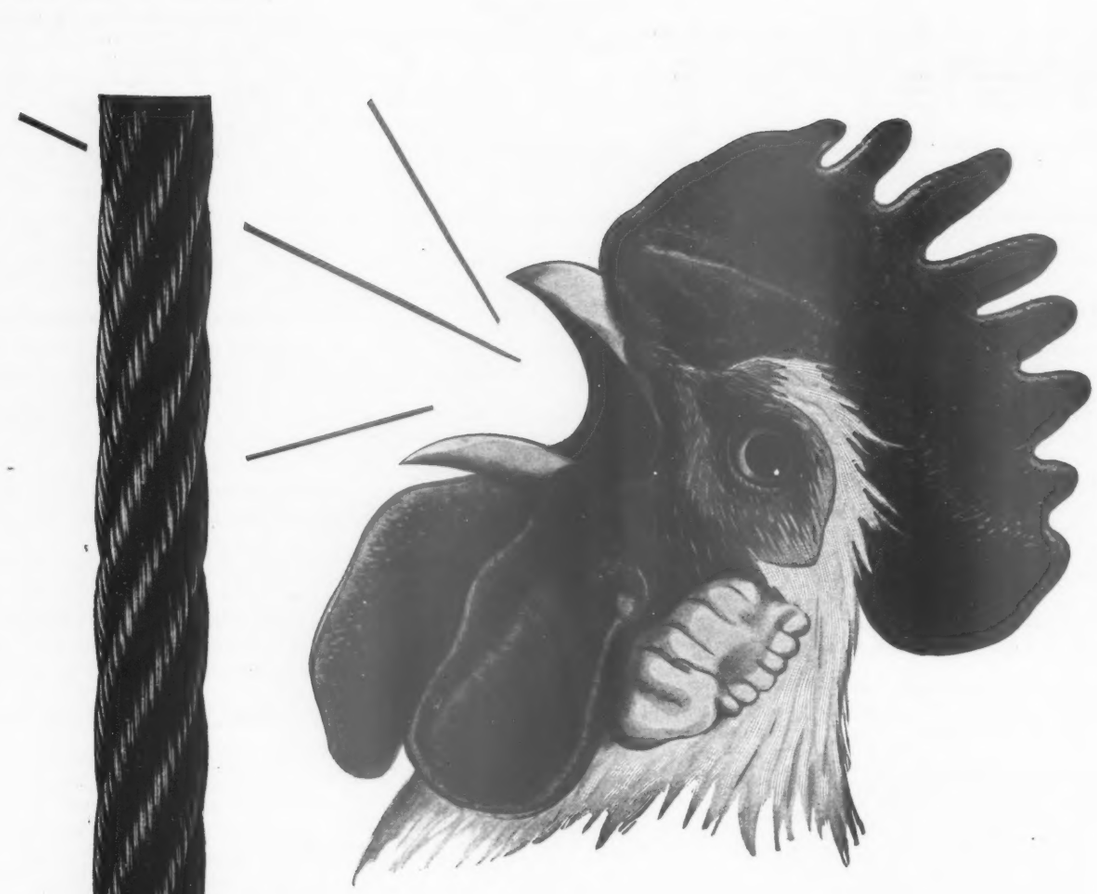
**TABLE 4**

| Month— | Hook-wall packers | | Formation packers | | Dump ballers | | Displacement | | Braden-head | | Liners | | Retainer | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | |
| January | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 5.9 | 9 | 52.9 | 2 | 11.78 | 5 | 29.42 | 17 |
| February | 1 | 3.70 | 0 | 0 | 0 | 0 | 2 | 7.41 | 4 | 14.82 | 2 | 7.41 | 18 | 66.66 | 27 |
| March | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 10.0 | 1 | 10.0 | 1 | 10.0 | 7 | 70.0 | 10 |
| April | 1 | 6.25 | 0 | 0 | 0 | 0 | 5 | 31.25 | 0 | 0 | 1 | 6.25 | 0 | 56.25 | 16 |
| May | 1 | 11.1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 11.1 | 0 | 0 | 7 | 77.78 | 9 |
| June | 0 | 0 | 5 | 35.7 | 0 | 0 | 1 | 7.1 | 0 | 0 | 0 | 0 | 8 | 57.2 | 14 |
| July | 1 | 11.1 | 1 | 11.1 | 1 | 11.1 | 0 | 0 | 1 | 11.1 | 0 | 0 | 5 | 55.6 | 9 |
| August | 0 | 0 | 2 | 33.34 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 16.66 | 3 | 50.0 | 6 |
| September | 0 | 0 | 2 | 22.2 | 0 | 0 | 0 | 0 | 1 | 11.1 | 1 | 11.1 | 5 | 55.6 | 9 |
| October | 1 | 11.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 88.9 | 9 |
| November | 1 | 8.34 | 2 | 16.68 | 0 | 0 | 0 | 0 | 4 | 33.36 | 0 | 0 | 5 | 41.62 | 12 |
| December | 1 | 20.0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 20.0 | 0 | 0 | 3 | 60.0 | 5 |
| Total | 7 | 4.89 | 12 | 8.34 | 1 | 0.7 | 10 | 7.0 | 22 | 15.38 | 8 | 5.59 | 83 | 58.05 | 143 |



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# Operating Ideas

## Welded Bend In Mud Line

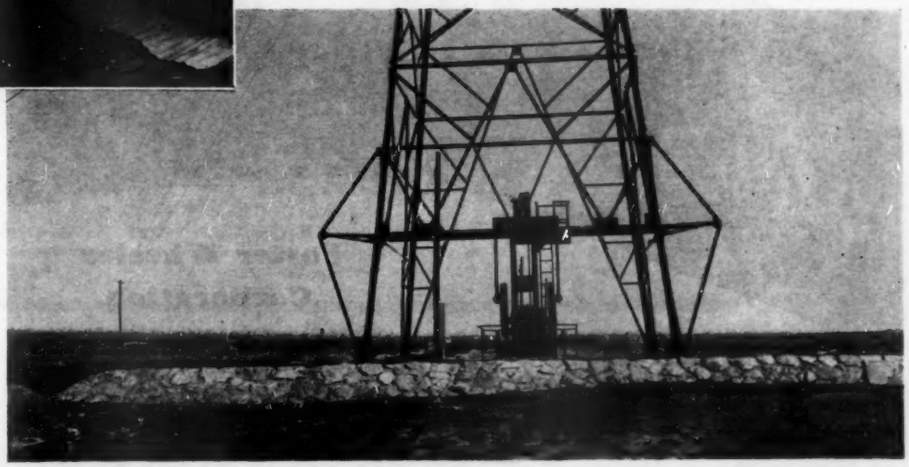
Efforts are being made by many contractors to eliminate as many turns in the mud line as possible. Ordinarily the line coming from the manifold between the pumps drops to the ground, where a turn is made with a half swing. One Oklahoma contractor makes a long bend and eliminates several turns in the line. The bend was made by a welder.

## Stand Kelly Back Instead Of Drilling a Rathole

A fishing job on a producing well in the Oklahoma City field required no circulation of drilling fluid; also the derrick was built on a solid concrete base. Instead of drilling a rathole through the concrete floor a single board was placed in the derrick and the kelly stood back the same as in the days before ratholes were introduced.

## Rock Retaining Wall Around Well

A Mid-Continent company uses native stone to build retaining walls around its wells. Primary purpose of the wall is to prevent erosion of the surface during heavy rains. The wall allows the area immediately around the well to be filled and graded so that an ample and smooth working space results. It simplifies rigging up of the tubing truck and provides safer working conditions for the crew when it becomes necessary to pull rods and tubing on the well. This particular well is pumped by an electric-motor-driven unit having an automatic time-cycle control.



## Plates Reduce Wear

Method of operating a tail wagon requires that the handle be held on the walk while a load is being carried. This wears the handle through and allows it to catch on splinters or uneven boards. One contractor has shoes welded on the handles at the point where they contact the walk, which makes a better skidding surface and reduces handle wear.

# Prevention of Corrosion of Steel Pipe Lines by Oil-Well Brines

By WILLIAM STERICKER
Philadelphia Quartz Co., Philadelphia, Pa.

IN June 1938 the pipe lines in a brine-disposal system were found to be in very bad condition. . . . Test sections cut from the line at various points all showed bad corrosion and it seemed that the entire system would have to be replaced within a year. The pipes had been installed in 1933 and the system started operating about the beginning of 1934. The life of the steel pipe would be, therefore, about 5 years. At the time the original installation was made, short sections of various kinds of metallic pipe were inserted for test, but all of them corroded badly. It was decided that the use of steel pipe line with replacement when necessary was as economical as any method.

*A.P.I.*—Abstract of paper presented at spring meeting of Southwestern District A.P.I., Division of Production, Shreveport, La., February 27-28.

At this time R. H. Fash of the Fort Worth Laboratories suggested that sodium silicate might provide a protective coating on the inside of the steel pipe used to carry the oil-well brine. We were asked to suggest the kind and amount of silicate to be used. In his laboratory experiments U. R. Evans[1] had found sodium silicate was the best inhibitor of corrosion by brines but the amounts used were so great that the treatment would not have been feasible economically. However, it had been found in water treatment that much smaller amounts of silicate were necessary to prevent corrosion under actual circulating conditions than in stagnant laboratory tests. Preliminary tests with some of the brine from the field indicated that under pipe-line conditions 40 p.p.m. of soluble silica would give at least 80 per cent protection and probably more. Therefore, the addition of 100 gal. of silicate of soda containing 8.9 per cent $Na_2O$ and 28.7 per cent $SiO_2$ to each 1,000,000 gal. of salt water was suggested. When this silicate was added to the brine without dilution, a precipitate formed. If the silicate were diluted to 10 times its volume with water before it was added to the brine, precipitation was avoided at the high dilutions which actually existed in the pipe line. The method of feeding was simplified with the more dilute solution. The actual addition was made by means of needle valves on the suction side of the centrifugal pumps used to pump the brine.

The field was producing approximately 6,000 bbl. of salt water at the time the test was started. . . . After it is separated from the oil, it is collected in pits. From these pits the brine is pumped through 6-in. steel lines to the main line which is an 8-in. pipe. This discharges into a large storage reservoir. There is a total of over 5 miles of 6-in. pipe and about 4½ miles of 8-in. pipe.

The silicate feed was started on June 4, 1938. The pump for the brine was a 2-in. centrifugal which turned at 3,500 r.p.m. and pumped 10,500 gal. per hour. To this were added 10.5 gal. of diluted silicate per hour by means of a needle valve. . . .

In spite of the failure to add sufficient silicate at times, the number of leaks per month has been reduced from an average of 7.5 to 3.7 or approximately 50 per cent. In the 29 months immediately preceding the use of silicate there were 218 leaks and in the 30 months following the time when the silicate feed was started there were 111 leaks, 2 of which are definitely known to have been caused by external corrosion. This reduction comes in spite of the fact that the brine line is continually getting older and therefore would be expected to give more, rather than less, trouble. Shortly after the silicate feed was started, there was one month in which there were 28 leaks. These were due to building up pressure on the line to break out the weak spots so they could be located and repaired. There has been only one

[1] J. Soc. Chem. Ind. 46, 347-557 (1927).

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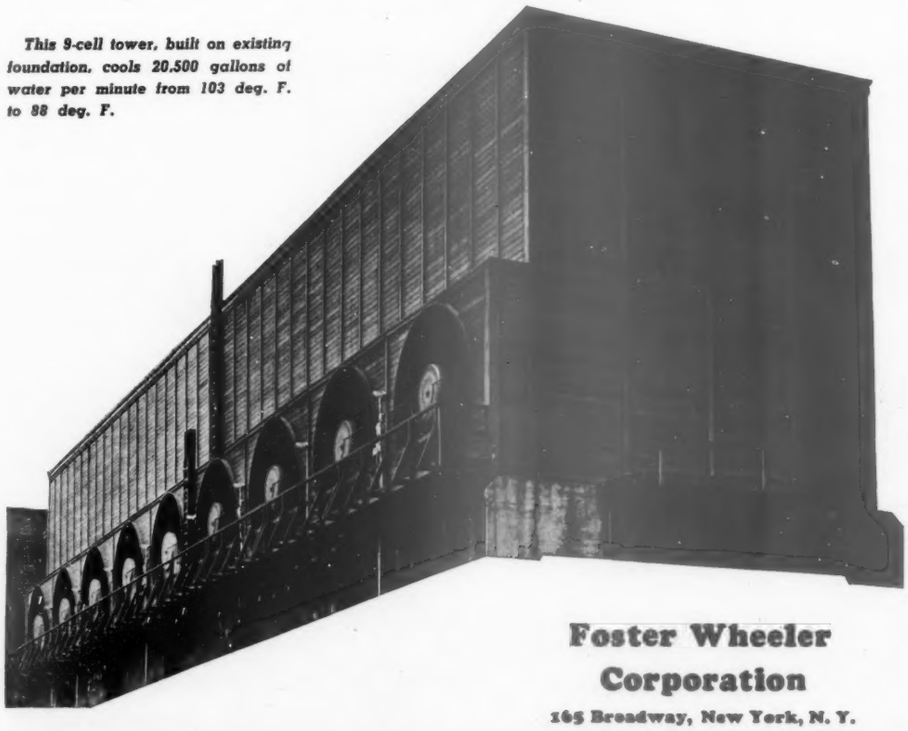

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other month while silicate was in the system in which there have been more than 10 leaks. With silicate there were 8 months out of 30 when no repairs were necessary, while without it there were only 6 months out of 29. Prior to the use of silicate there were 7 months out of 29 in which there were more than 10 leaks.

The use of silicate has saved the expense of installing a new line as well as having cut the operating costs due to the smaller number of repairs required. The treatment is being continued.

The results at the first location were so satisfactory that the decision was made to try silicate in a somewhat different way at a second location. At the latter the oil and salt water are pumped from the wells through gas separators into lease tanks. There is a line of 6-in. steel pipe about 3 miles long from this tank battery to the treating and storage tanks. About 2,800 bbl. of salt water and 1,000 bbl. of oil per day are pumped through this line. The presence of oil is the added factor at this location. . . .

### Discussion

Some explanation of the differences in the effectiveness of silicate as a corrosion preventive in these cases and in Evans' experiments is desirable. Evans used two salt solutions, one of low salinity containing 20 p.p.m. each of sodium chloride and sodium sulfate, and the other of high salinity, 250 p.p.m. each of these salts. The silicate he used in his experiments is not clearly defined, which is an unsatisfactory factor. Another factor about which he gives no details is the proportion of the volume of solution to the surface of the metal under test. This is a highly important factor in testing any corrosion method which depends on the formation of a film, since a very small volume of solution may not contain enough of the corrosion preventive to actually coat the surface. In the case of silica we know that it exists in several forms in solution and that not all of these are effective in preventing corrosion. Therefore the mere determination of a residual silica content is not sufficient to insure the presence of adequate silica for protection.

In many systems where the water or brine is flowing, fresh supplies of silica are being brought to the surface constantly. When the silicate concentrations are very low, as in the cases described in this paper, a considerable length of time is necessary to produce the protective film. After the film is once formed, a smaller concentration is sufficient to maintain it. For that reason, it is possible to reduce the feed after corrosion has once been checked. The use of somewhat higher concentrations initially will speed film formation. It is believed that in the cases reported here the beneficial results would have been obtained more rapidly if the recommended dosage of 40 p.p.m. of silica had been present. If the feed is discontinued entirely, the protective film gradually disappears and must be reformed to give the maximum protection.

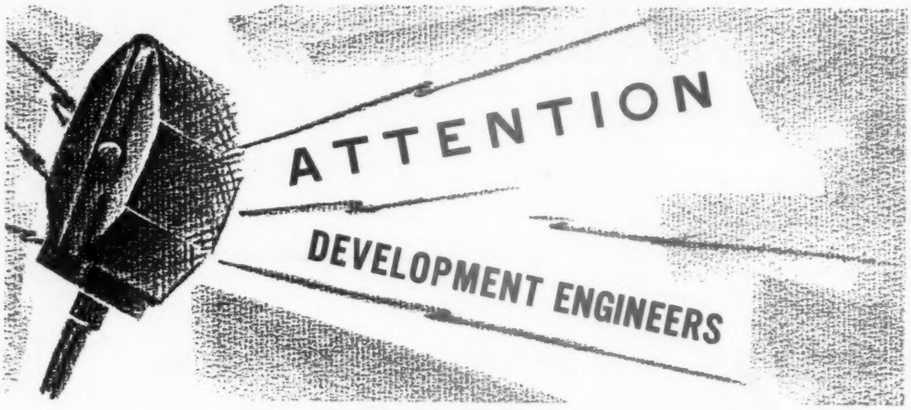
Evans' tests were carried out with maximum aeration which, of course, increases the amount of dissolved oxygen and therefore the intensity of the corrosion. In a pipe line the oxygen present at the start of the line is usually all that will be present. If there is corrosion as the water or brine passes through the line, the oxygen content will drop and will not be replaced. Likewise, organic matter present in the water or brine will be oxidized and reduce the oxygen content. Therefore, under these conditions, the laboratory test in which the excess of air is limited may be used as a check in determining whether sufficient inhibitor has been added to give the desired result.

Evans found that with his low salt content it was necessary to use 3,000 p.p.m. of his silicate to start protection; 8,000 p.p.m. to give good protection; and 19,900 p.p.m. to give complete protection. The corresponding figures for the more concentrated salt solution were 8,000, 15,000, and over 19,900 p.p.m., respectively. Of course, the use of any such quantities as these in systems such as the ones under discussion is economically out of the question. The most surprising thing in the tests reported in this paper is that so little silicate gave such a high degree of protection. Laboratory tests in closed containers have confirmed these results. The untreated brine produced heavy corrosion on steel samples, while the treated brine samples taken both at the beginning and at the end of the pipe line gave almost complete protection. . . .

Experiments now under way indicate that even under conditions of aeration silicate is much more effective than would be indicated by Evans' figures. Details of this work will be available later.

In the cases under discussion the fact that there was no precipitation of calcium and magnesium and that the brine became clear and free from suspended matter was relatively unimportant. However, if the brine is to be pumped into a disposal well the absence of precipitation and suspended matter will be a great advantage. Under such conditions it is very important that the formation into which the brine is being pumped does not become clogged. The amounts of silicate used are so low that the solubility of calcium and magnesium silicates has not been exceeded.

When silicate is used in water for the prevention of corrosion the old corrosion scale gradually disappears. The decrease in the thickness of the scale in the first case discussed indicates that a similar action has taken place in the brine lines. As the scale is removed, the effective diameter of the pipe increases and therefore pumping costs are lower. This is another advantage of this method of treatment. . . .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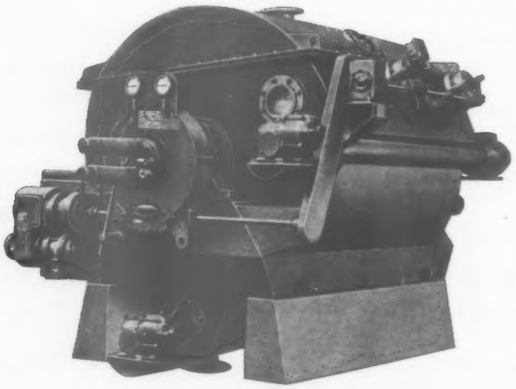

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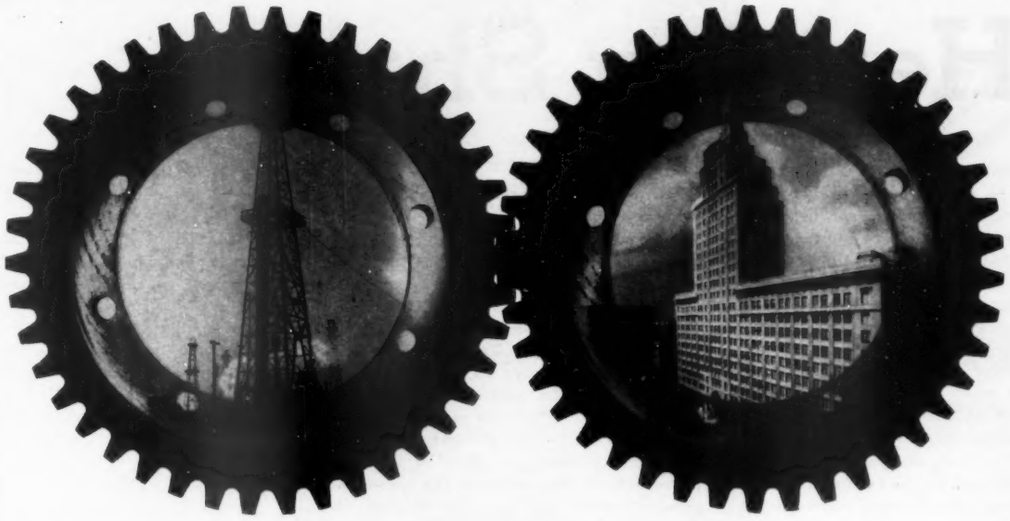

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# Occurrence and Treatment Of Heaving Shale

**Heaving shale has been one of the most troublesome problems encountered in drilling and often requires the expenditure of over $100,000 for a single well to overcome it. The accompanying article is composed of excerpts from a Bureau of Mines report of investigations, "The Role of Clay and Other Minerals in Oil-Well Drilling Fluids." The author, A. George Stern, associate chemical engineer, made an extensive research into the subject and traveled widely in gathering the material. While the report is intended primarily for the minerals industry, it contains a bulk of valuable information for drilling organizations and mud engineers. The material was presented before the Industrial Minerals Division of the A.I.M.E. in New York, Feb. 18, 1941.**

THERE is no general agreement among petroleum engineers as to the cause of heaving action which is commonly known as "heaving shale." Instances are reported where the heaving shale cores literally have exploded on the derrick floor upon removal from the core barrel. It is widely recognized that the presence of bentonitic material in the shale (which has the well-known property of expanding when saturated with water) is a contributing factor in the heaving action, but other conditions must coexist. In Wyoming, for example, the highly swelling bentonite does not cause heaving difficulties.

It is possible that a steep angle of repose of the bentonitic stratum may be the coexisting condition necessary to start slipping and consequent plastic flow. Numerous cases are on record to confirm such a surmise but more thorough (and very costly) investigations will be required before such a theory can be confirmed.

Heaving shales have been successfully penetrated by use of a sodium-silicate-salt-water mud of heavy weight (about 16 lb. per gal. or 120 lb. per cu. ft.), but this is an extremely expensive operation. Pressure drilling, because of its flexibility, should be particularly adaptable to heaving-shale drilling because the back pressure may be used to supplement mud pressures so that bottom-hole pressures may be maintained only a few hundred pounds short of the theoretical formation pressures. A specially prepared mud, which does not allow disintegration of the shale, in combination with some method for maintaining sufficient pressure at the drilling face to overcome plastic flow tendencies should permit successful penetration of the heaving shale.

### Definition of Term

The term "heaving shale" has been applied to so many different conditions that it is difficult to classify a particular operation and state definitely whether it is a heaving shale or not. Wade[1] points that out and stresses the need for a concise definition for "heaving shale."

Within the past few years, several operations in the Gulf Coast were abandoned, and the cause was attributed to heaving shale. As a single example, several years ago at Pierce Junction (near Houston), Texas, each time the drilling of one hole exceeded a depth of 3,000 to 4,000 ft., the hole caved and it became necessary to withdraw the bit and start drilling again. Later (in 1934) when chemical treatment with polyphosphates was used, this same hole was drilled and not a single heave occurred. Prior to 1934 this hole would have been classed as a heaving shale; but not thereafter.

One of the important clay chemicals used in oil-well drilling operations is known as "bentonite." This term has been misused so extensively during the past few years that an effort is being made to avoid the loose terminology and refer to the minerals composing the bentonites. Of these, montmorillonite is the most common component. Identification of a clay sample to determine whether it is a montmorillonite or not is usually a fairly difficult task. Measurement of physical properties of a clay by a tedious series of tests has been the most usual way of determining whether a clay is a swelling montmorillonite or not and has not been at all satisfactory. Even X-ray involving complex research methods has not solved the problem in many cases.

To make this determination, an extremely simple color test to indicate (swelling?) montmorillonite has been developed[2] which can be carried as a compact field kit occupying but little space.[3,4] Benzidine is slightly soluble in water (about 0.5 per cent); hence a saturated solution is readily prepared by shaking the benzidine with water. This, when placed in a small bottle, is the reagent. A small white test plate, dropper, and penknife complete the equipment. When a sample of clay is to be tested, a small amount of the dry clay is placed on the test plate; a few drops of the benzidine reagent is used to wet it; and, if a vivid blue color results, montmorillonite probably is present. The test is sufficiently sensitive that the clay can be diluted with 500 parts of inert material and still the blue color will show up when benzidine is added.

### Base Exchange

Since the swelling is dependent on a phenomenon known as "base exchange," it is important that the swelling bentonites be given as large a base-exchange capacity as possible. By that is meant the property of adsorbing and exchanging ions of soluble salts; the greater the adsorption the more swelling is the bentonite. [Editor's note: In heaving-shale treatment this fact is recognized and where possible, base exchange is kept as low as possible and the tendency of the shale to heave minimized.]

Small amounts of sodium silicate will deflocculate most muds, especially when the concentration is maintained below 1 per cent. Baker and Garrison[5] emphasize this and point out that along with the deflocculation, the silicate contributes to the mud alkalinity and thereby reduces the amount of other more expensive alkaline chemicals required for conditioning the mud.

Another use for sodium silicate is a highly concentrated mud of which the liquid portion consists of a mixture of one-third saturated salt water (sodium chloride) and two-thirds sodium silicate (containing 28 per cent solids and a $Na_2O$ to $SiO_2$ ratio of 1:2).

The use of muds which have sodium silicate as the "liquid phase" has been extensively tested especially to combat "heaving shale" conditions.

The main property of silicate-salt mud suspension is that the colloidal character (if any) of the mud is not changed when a salt condition is encountered in the formation because the mud fluid already has been flocculated by the salt. As stated, the liquid portion consists of a mixture of one-third saturated salt water (sodium chloride and two-thirds sodium silicate.) In order to increase the density of the mud, weighting material (barite for example) frequently is added until the specific gravity of the mud is approximately twice that of water (16.6 lb. per gal. or 125 lb. per cu. ft.) To maintain the weighting material in suspension a certain amount of colloid-forming clay (bentonite for example) is usually added even though the colloidal action is inhibited or completely destroyed due to the flocculating action of the salt and silicate electrolytes.

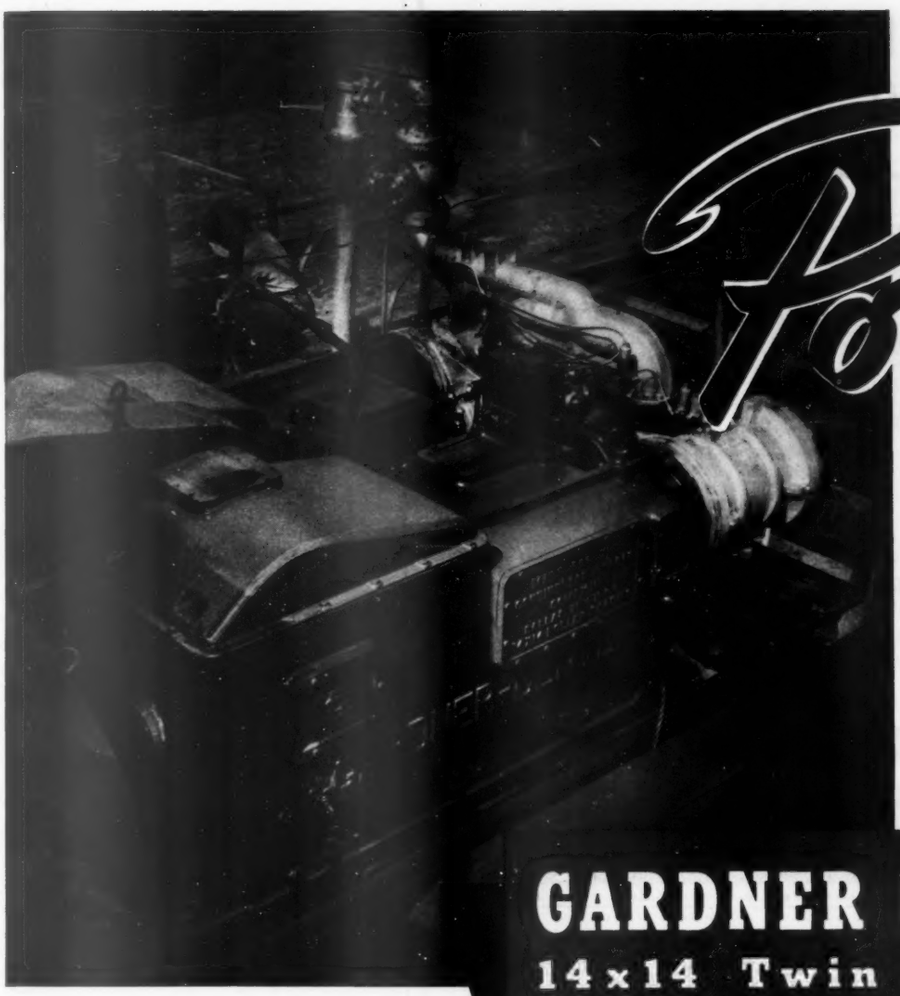
### Promising Technique

Although first suggested in 1935 by Rzhanitsyn and Tsarevich,[6] Baker and Garrison[5] report several tests using silicate under heaving-shale conditions and it appears that the salt-silicate liquid phase is the most promising technique at the present time for controlling a condition when salt water is encountered and also the so-called "heaving shale." High cost of the silicate is one important deterrent and the other is the unfortunate fact that not a single well which was drilled has produced enough oil to justify the cost involved even though in several cases the drilling operations were classed as technically successful.

The wall-building or "filter test" is erratic when measured on a silicate mud. The filter cake is brittle and not uniform in character. This erratic quality makes it difficult to control operations and adds another hazard to the drilling difficulties.

The use of silicate has another objection. It is quite common practice during drilling to have electrical-conductivity determinations made by lowering a set of electrodes into the bore-hole and noting the characteristics (resistivity) of the formation. These electrical determinations are predicated upon the usual condition that the drilling mud is a relatively poor electrical conductor. The silicate-salt mud, however, contains a high concentration of electrolyte and therefore is an electrical conductor. Hence it is extremely difficult to secure an electrical log of a bore-hole when the silicate-salt mud is used and many operators are unwilling to use it for that reason.

Starch has been considered for several years, in fact it was mentioned by Harth[7] but only recently has it been proposed to hydrolyze the starch with alkali and in that way improve the colloidal dispersion of the starch. The use of the hydrolized starch which is prepared by boiling



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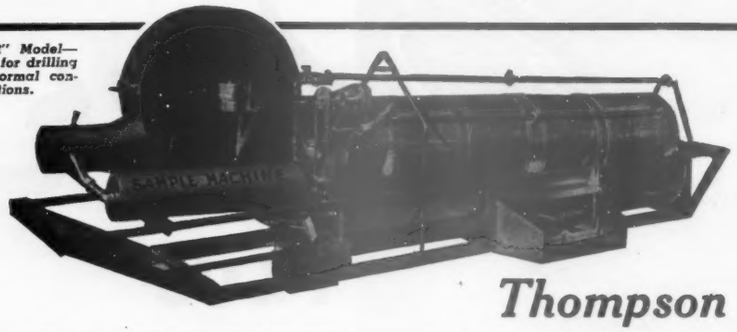

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a 1 per cent starch suspension with sodium hydroxide (one-tenth per cent by weight; or starch/sodium hydroxide:10/1) at a pH of about 11 or 12 has been found to give a good "filter test" and to suspend the weighting material quite satisfactorily. One important point is the fact that the starch has a tendency to ferment unless a preservative is added. An effective preservative is sodium chloride (salt), so that it is possible to accomplish a dual function when drilling through a salt formation. It is surprising that the hydrolized starch does not increase the viscosity of the mud (in fact, reduces it slightly) and that the main effect is an improvement in the "filter test" even when salt conditions are encountered. Certain clays are added to the mud to give it "body" even though the colloidal portion is replaced by the starch. This starch treatment is not nearly so expensive as is the silicate mud and according to Cannon[8] may be at least equally effective.

*Editor's note.* — The foregoing points out the three principal routes of attack on the heaving shale problem: a minimum water loss, a minimum of base exchange and a high specific gravity. The former two prevent swelling of the bentonite which causes the heaving and the latter helps prevent any movement of the formation into the hole. The use of starch is a new development and is still in the experimental stage. Those familiar with this treatment have high hopes for its success in the combating of heaving shale as well as the solving of other problems. Also, in very recent months, a treatment using sodium alginate has been brought before the industry by H. T. Byck, Shell Development Co., Emeryville, Calif.

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# BOOKS

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This directory indicates for each city the frequency (cycles) and the voltages for single-phase, three and two-phase, and for d.c. if any; and in many cases, the kilowatt capacity of the plant or plants supplying the current. The book is arranged alphabetically by countries and cities, data covering the principal cities in 129 different countries and islands being included.

This information has been accumulated by the writer over a period of 20 years of activity in export sales of electrical motors and generators for the Century Electric Co., St. Louis, Mo. More than half of the past 20 years has been spent in traveling in practically all countries of the world, during which time much of the data contained in the book was collected personally. It is the author's opinion that this is the first time that these data have been available in brief compact form under one cover.

*"World Directory of Electric Current Characteristics," may be purchased through the Book Department of The Oil and Gas Journal at the established retail price of $5, postage prepaid (extra outside the United States), and a copy will be forwarded promptly upon receipt of check or money order for that sum. Where payment is not provided, the book will be sent c.o.d. to avoid delay.

# Appraisal of Steels for High-Temperature Refinery Service

By DR. CLAUDE L. CLARK
Research Metallurgical Engineer, Timken Roller Bearing Co.

**Creep strength is only one of the properties which must be considered in an application of steel for high-temperature service. The steel must also possess the desired degree of surface stability (resistance to oxidation and corrosion), structural stability, and the ability to retain suitable physical properties, both hot and cold, under the combined influence of time, temperature and stress. Laboratory tests have been developed to determine all these characteristics with exception of corrosion resistance.**

APPLICATIONS of steel to high-temperature service can be divided into three groups on the basis of the following conditions: (1) Permissible deformation during service, (2) constant versus varying temperatures, (3) relative importance of strength and surface stability.

As examples, in valve and turbine parts and bolting the permissible deformation for satisfactory service is limited to small amounts while in oil-cracking tubes relatively large deformations can be allowed. The life of these tubes is often based on visual bulging which implies a total deformation of 5 per cent or greater. In high-temperature steam lines the maximum operating temperature is relatively fixed and constant, while in cracking-still tubes the metal temperatures may rise continuously during the operating cycle due to the deposition of coke on the inside wall. Likewise, in refineries operating with a sweet crude, strength and oxidation resistance may be the primary requirement, while if sour crudes are used the corrosion resistance is of the greatest importance.

Since the requirements vary so greatly the laboratory tests must be adjusted to give the desired information. Fig. 1 shows the tests which are most commonly used for determining the characteristics of steels intended for high-temperature service. Certain room-temperature tests are included, for the inspection of these steels is usually based on these properties. The tests show the load-carrying ability, the surface and structural stability, the hot ductility under the influence of time and stress, and the high-temperature shock resistance. None of the so-called short-time tests for revealing the strength properties are included, but these will be briefly reviewed later.

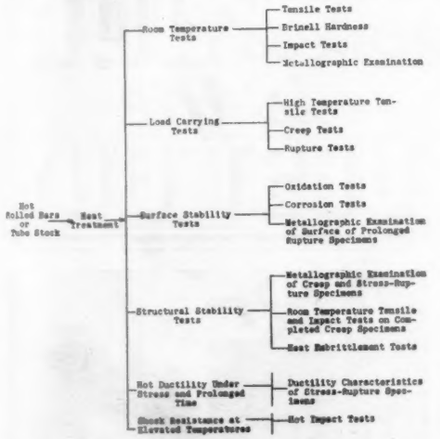


*Fig. 1—Diagrammatic sketch of tests employed in determining the suitability of steels for high-temperature service*

The creep test is at present the one most commonly used for determining high-temperature strength although the stress-rupture test is spreading rapidly and the short-time high-temperature tensile test is still often used as a basis for design.

*Creep tests.*—Creep-test procedure varies, but in general specimens are maintained under constant stress for at least 1,000 hours and the rate of creep or deformation determined. Typical curves resulting from this procedure are given in Fig. 2.

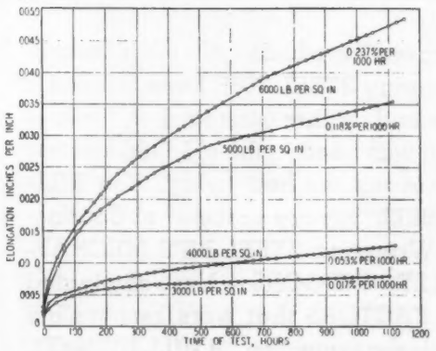
ELONGATION, INCHES PER INCH
TIME OF TEST, HOURS
6000 LB PER SQ IN
5000 LB PER SQ IN
4000 LB PER SQ IN
3000 LB PER SQ IN
0.237% PER 1000 HR
0.118% PER 1000 HR
0.053% PER 1000 HR
0.017% PER 1000 HR

*Fig. 2—Time-elongation curves of high-silicon 4-6 Cr Mo steel at 1,100° F.*

The creep rates given are expressed in per cent per 1,000 hours and designers often assume that 0.01 per cent per 1,000 hours is equivalent to 1 per cent per 100,000 hours. This may or may not be a valid assumption.

Often the result from the type curves of Fig. 2 are expressed in terms of total deformation rather than as creep rates. If this procedure is to be followed then the slope line is extended back to the elongation axis and the total deformation is this intercept plus the creep rate multiplied by the desired time period. This assumes that the creep rate will remain constant for periods beyond those actually employed in the tests.

Usually, if the stresses and corresponding creep rates are plotted to logarithmic coordinates a relationship exists which permits the determination of stresses corresponding to definite creep rates such as 0.01 and 0.10 per cent per 1,000 hours. This relationship may be expressible by one straight line or a break may occur if the stress range considered is sufficiently broad. For example, in Fig. 3 a single straight-line relationship exists for stresses corresponding to creep rates up to about 0.2 per cent per 1,000 hours, but beyond this the creep rate increases at a more rapid rate than the stress.

The stresses for definite creep rates, Fig. 3, can be plotted against temperature, Fig. 4, and some indication obtained as to the creep strength at the intermediate temperatures. This method of presentation also shows the rate at which the creep strength decreases with increasing temperatures.

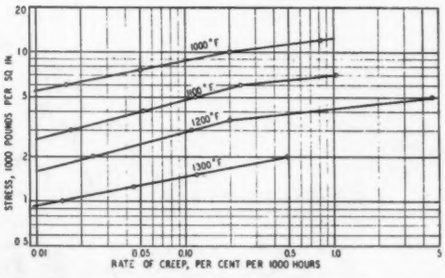


*Fig. 3—Stress-versus-creep-rate curves for high-silicon 4-6 Cr Mo steel at indicated temperatures*

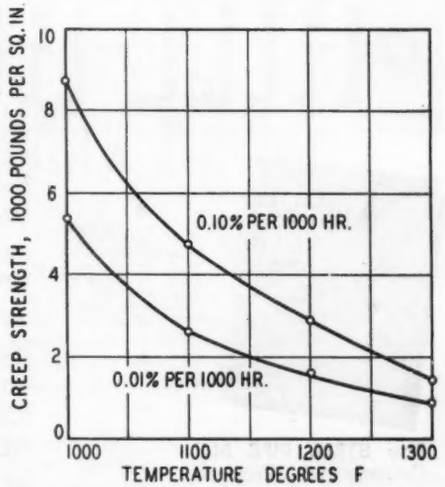


*Fig. 4—Creep strength of high-silicon 4-6 Cr Mo steel at indicated temperatures*

*Stress-rupture tests.*—In the stress-rupture tests a series of specimens of each steel at each temperature are broken under constant load with the stresses being so selected that fracture will result over time periods varying from a few min-

utes up to a maximum of several hundred or several thousand hours. The results obtained are valuable not only for showing the load-carrying ability but also for obtaining the hot ductility up to fracture and for indicating the degree of surface and structural stability under the given test conditions.

*Load-carrying ability.*—If the stresses and corresponding fracture times are plotted to cartesian coordinates then curves of the type shown in Fig. 5 will result. These curves appear to become asymptotic to definite limiting stresses and it is thus possible to obtain an indication of the stress below which fracture will not result for very extended time periods.

A more definite relationship exists when the results are plotted to logarithmic coordinates. If the steel possesses a sufficient degree of both surface and structural stability under the given test conditions, this method of plotting results in a single straight-line relationship over the entire time period considered. This condition is shown in Fig. 6.

If, on the other hand, the steel is lacking in either type of stability then a break will occur in the straight-line relationship over the entire time period considered. This condition is shown in Fig. 7.

If, on the other hand, the steel is lacking in either type of stability then a break will occur in the straight-line relationship after a certain time period, as shown in Fig. 7. After the break has once occurred, a straight-line relationship again results but it has a steeper slope than that of the original line. This has been substantiated by several tests of 10,000 to 20,000 hours' duration. In the case of Fig. 7 the break in the relationship at 1,200°, 1,300° and 1,500° F. is mainly due to lack of sufficient resistance against oxidation.

The relationships of Figs. 6 and 7 permit the determination of the stresses required for various fracture-time periods. Because of the definite relationship which exists and the certainty of the values, that is, stress and fracture time, extrapolation is believed permissible for time periods up to 100,000 hours. At least this is believed to be more justified than in the case of the creep results for the creep rate may vary greatly, depending upon the time period used for its determination.

The stresses for fracture-time periods varying from 1 to 100,000 hours, as determined from the type relationship shown in Figs. 6 and 7, may be plotted against temperature as in Fig. 8. As will be discussed later, curves of this type are also of value in indicating the behavior of a given

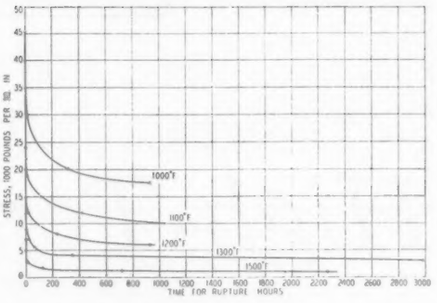


*Fig. 5—Stress-rupture curves for 4-6 Cr Mo Si steel at indicated temperatures*

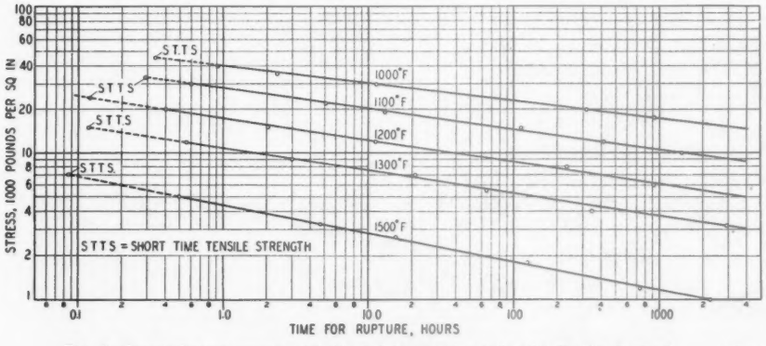


*Fig. 6—Stress-rupture curves at indicated temperatures for 4-6 Cr Mo Si steel*

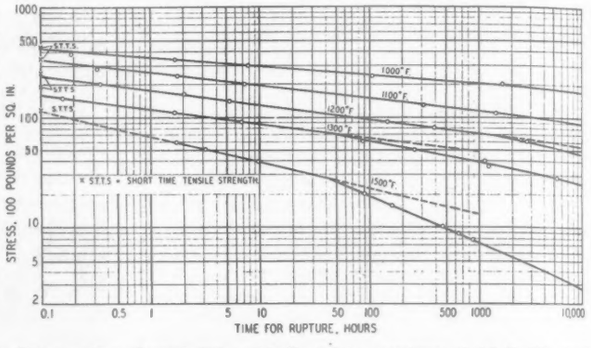


*Fig. 7—Stress-rupture characteristics at indicated temperatures of 4-6 Cr Mo steel*


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steel under overheating and thus overstressing conditions.

*Ductility up to fracture.*—One of the chief merits of the stress-rupture test is its ability to show the influence of time, temperature and stress on the hot ductility up to fracture. Information of this type is used to insure against brittle type

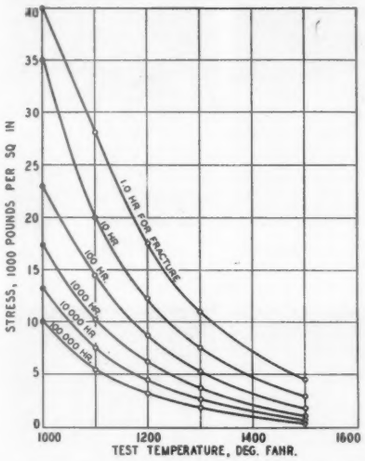


*Fig. 8—Stress required for fracture in designated time periods for high-silicon 4-6 Cr+ Mo steel*

fractures in service. No other high-temperature test reveals the ductility characteristics to be expected when failure occurs over a prolonged time period.

Steels differ widely in their ability to retain a high degree of ductility under the combined influence of time and stress. This depends upon the composition and temperature. The media to which the steel is subjected during service are believed to be an important factor but little information is as yet available.

Figs. 9 and 10 are included to illustrate typical

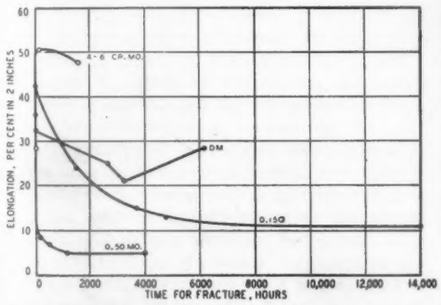


*Fig. 9—Influence of fracture time on the ductility at 1,000° F.*

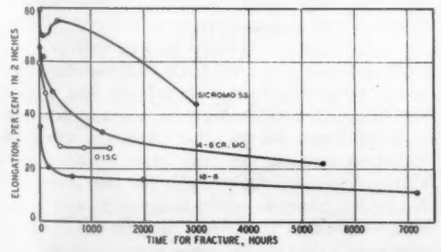


*Fig. 10—Influence of fracture time on the ductility at 1,300° F.*

differences which may exist in the hot-ductility characteristics of steels when fracture occurs over prolonged time periods. From Fig. 9 it is apparent that at 1,000° F. and under the given test conditions, both plain carbon and 0.50 per cent molybdenum steels lose their ductility at a rapid rate as the time for fracture is extended. The elongation of plain carbon steel after a fracture time of 14,000 hours is only 11 per cent, while that of 0.50 Mo steel is only 5 per cent after 4,000 hours. On the other hand, DM and 4-6 Cr Mo steels retain a good degree of ductility at 1,000° F. under the same test conditions.

Likewise at 1,300° F., Fig. 10, 18-8 loses its ductility at a rapid rate, its elongation value after 7,200 hours being 11 per cent. While 4-6 Cr Mo retained a high degree of ductility at 1,000° F., its elongation at 1,300° F. decreases relatively rapidly. Plain carbon steel retains its ductility better at 1,300° F. than at 1,000° F.

It can be argued that these values were obtained under overstressed conditions and that under usual operating stresses the ductility would not be influenced, at least to as great an extent. No information is as yet available to support this belief and it hardly seems likely that a reversal in trends is to be expected. For example, in the case of plain carbon steel at 1,000° F., Fig. 9 shows the ductility to decrease continuously as the fracture time is extended up to 14,000 hours, or as the stress is decreased from 36,500 to 6,000 lb. No basis exists for assuming that the ductility would again increase if the fracture time were further extended. Commercial failures of the brittle type have occurred in plain carbon, 0.50 Mo and 18-8 steels. These lend support to the results obtained from the stress-rupture tests.

*Surface and structural stability.*—The stress-rupture test provides a convenient and easy method for determining the relative degree of surface and structural stability under the given test conditions. As previously shown, if the steel possesses sufficient stability then a single straight-line logarithmic relationship will exist between stress and fracture time as shown in Fig. 6. If the steel is lacking in either type of stability, then a break will occur in this relationship as demonstrated in Fig. 7. A metallographic examination will in-

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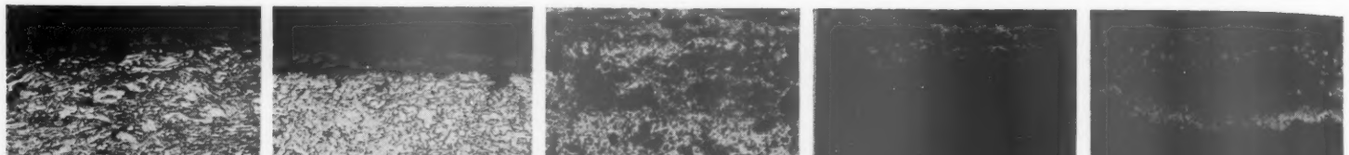
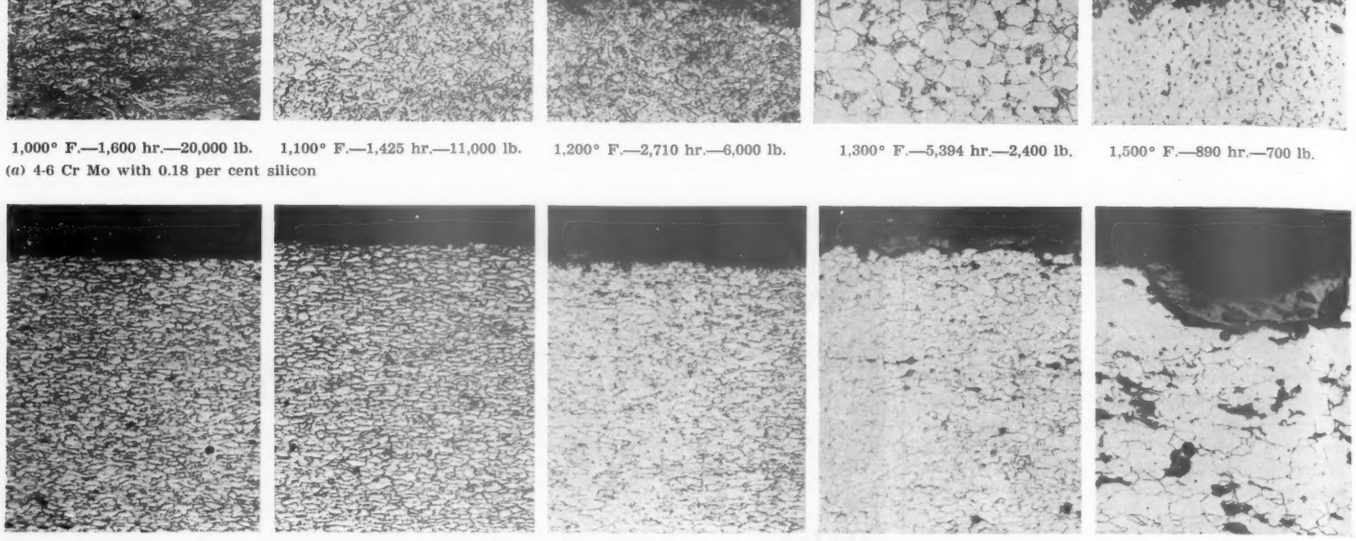


1,000° F.—1,600 hr.—20,000 lb. 1,100° F.—1,425 hr.—11,000 lb. 1,200° F.—2,710 hr.—6,000 lb. 1,300° F.—5,394 hr.—2,400 lb. 1,500° F.—890 hr.—700 lb.

(*a*) 4-6 Cr Mo with 0.18 per cent silicon



1,000° F.—930 hr.—17,500 lb. 1,100° F.—1,044 hr.—10,000 lb. 1,200° F.—927 hr.—6,000 lb. 1,300° F.—2,987 hr.—3,200 lb. 1,500° F.—2,268 hr.—1,000 lb.

(*b*) 4-6 Cr Mo with 1.50 per cent silicon

***Fig. 11—Influence of time, temperature and stress (rupture tests) on the surface and structural stability of two steels of the 4-6 Cr Mo Type —X100***

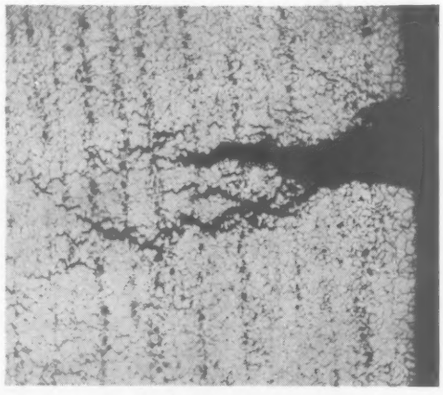
dicate the type stability in which the steel is lacking.

Fig. 11 shows the microstructures at the surface of the more prolonged rupture specimens of the two steels considered in Figs. 6 and 7. In Fig. 6 no break occurred at any temperature in the logarithmic relationship of the 4-6 Cr Mo plus Si steel and the microexamination shows this steel to possess a high degree of surface and structural stability at temperatures up to and including 1,300° F. At 1,500° F. some grain coarsening occurred but this was not sufficient to destroy the original relationship. The lower-silicon 4-6 Cr Mo steel did show a break in its relationship at temperatures of 1,200° F. and higher and the microstructures show this steel to possess a low degree of surface stability against oxidation at these temperatures.

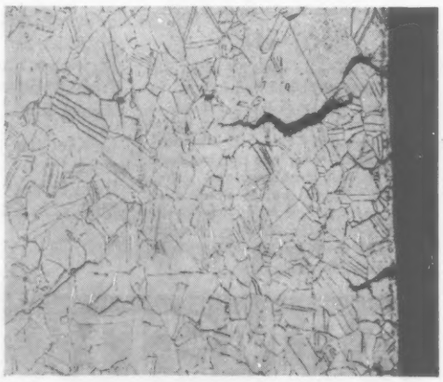
A low resistance to general oxidation does not necessarily imply that the ductility will be decreased with increasing fracture times. If the oxidation is of the intergranular type, and if excessive intergranular cracking occurs, then the ductility will be greatly decreased as the time for fracture is extended. For example, Fig. 12 shows intergranular cracking and oxidation in the 0.15 C. steel specimen which required 14,000 hours for fracture at 1,000° F. and intergranular cracking in the 18-8 specimen which fractured at 1,300° F. after 1,978 hours. The elongation up to fracture of these specimens was 11 and 16 per cent, respectively. Excessive intergranular cracking and attack occurs in 0.50 M. steel at 950° and 1,000° F.

In addition to general and intergranular oxidation and intercrystalline cracking a break may result in the logarithmic relationship at certain temperatures due to the influence of time and stress on the strain hardening and recrystallization characteristics.

*Relative merits of creep and rupture tests.*—Creep and rupture tests each possess certain ad-



(*a*) 0.15 carbon steel
1,000° F.—13,950 hours—6,000 lb.



(*b*) 18 Cr-8 Ni Steel
1,300° F.—1,978 hours—8,000 lb.

***Fig. 12—Examples of excessive intercrystalline oxidation and cracking under the combined influence of temperature, time and stress—X100D***

vantages and disadvantages. The question of which yields the most satisfactory results depends upon the intended high-temperature application. To completely establish the load-carrying ability both types of test should be employed.

The creep test is ideal for those applications in which the deformation is limited to very small amounts because in this test the rate of creep and the total deformation is determined. In general, it is impossible to conduct these tests for time periods even approaching those used in service and consequently it is necessary to resort to extrapolation to obtain design stresses. As previously mentioned, a creep rate of 0.01 per cent per 1,000 hours is commonly assumed to be equivalent to one of 1 per cent per 100,000 hours. This may or may not be true as the values being extrapolated may themselves be dependent upon the testing time employed. The dangers involved in this procedure are illustrated by the following findings. For a certain steel at 1,000° F., a 6,000-lb. stress produced a creep rate at 4,000 hours of 0.270 per cent per 1,000 hours which would ordinarily be assumed as being 2.7 per cent per 10,000 hours. Yet this specimen actually fractured in 14,000 hours. On the other hand, the creep data indicated that in the case of a 4,000-lb. stress extrapolation would be safe, for the creep rate from 4,000 hours to 16,000 hours decreased rather than increased. The stress-rupture data indicate that even this 4,000-lb. stress would produce fracture in about 50,000 hours, under the given test conditions, with a total elongation of less than 10 per cent.

The stress-rupture test does not necessarily yield any information on the creep rate, accordingly, its use is not advisable for application where appreciable deformation is not permissible. The maximum tonnage of high-temperature steels is in the form of tubes or pipe and relatively large deformations can be allowed. The major portion of the bulging of pipes or tubes occurs

during overheating, and thus overstressing, conditions. These abnormal conditions are generally of relatively short duration. Consequently the rate of deformation during this time is rapid, more comparable to that used in the rupture tests than in the creep tests. The relative strength of many steels, and especially the more highly alloyed ones, varies, depending upon the rate of deformation considered. This test is accordingly believed more suitable than the creep test for these applications.

While both types of test can be used as a measure of load-carrying ability, the rupture test, as previously shown, yields other valuable information with respect to the hot ductility up to fracture, the influence of time, temperature and stress on the structural and surface stability and the behavior of the steel under overheating, and thus overstressing, conditions. Its use in this latter respect is well demonstrated by Fig. 8. If a fiber stress of 5,000 lb. be assumed, then this particular steel would have an indefinite life at 1,000° F. and would require slightly more than 100,000 hours for fracture at 1,100° F. If the temperature should rise during the operating cycle then 10,000 hours would be required for fracture at 1,150° F., 1,000 hours at 1,250° F. and only 100 hours at 1,300° F. The maximum degree of overheating, and the permissible time under these severe conditions, is thus clearly shown.

An examination of the results from creep and rupture tests on 25 different steels at several different temperatures indicates that rather definite relationships exist between the results from these two tests. These relationships are shown in Table 1.

**TABLE 1**

**Factors* for Converting Rupture Strength (100,000 hours) to Creep Strength (0.01 per cent) and Tensile Strength to Rupture Strength (100,000 hours)**

*Rupture Strength (100,000 hours) to Creep Strength (0.01%)*

| | | | |
|---|---|---|---|
| A. Steels with Cr in excess of 1.5%: | | | |
| (1) 2 to 6% Cr, 0.50 Mo, 0-1.5 Si | 1/2 | R.S. = | C.S. |
| (2) 2 Cr, 1.0 Mo, 0.50 max. Si | 1/2 | R.S. = | C.S. |
| (3) Al bearing steels | 2/5 | R.S. = | C.S. |
| (4) Steels with 1.0 Mo: | | | |
| (*a*) 3 to 6% Cr | 1/3 | R.S. = | C.S. |
| (*b*) 6 to 8% Cr | 1/4 | R.S. = | C.S. |
| (*c*) 8 to 10% Cr | 1/5 | R.S. = | C.S. |
| (5) 6 to 10% Cr, 0.50 or 1.0 Mo: | | | |
| (*a*) 6 to 8% Cr | 1/5 | R.S. = | C.S. |
| (*b*) 8 to 10% Cr at 1,100° F. | 1/5 | R.S. = | C.S. |
| at 1,200° and 1,300° F. | 1/2 | R.S. = | C.S. |
| B. Steels with 0.0 to 1.5% Cr: | | | |
| (1) Each analysis must almost be considered separately due to differences in their strain hardening characteristics and surface and structural stability. | | | |

*Tensile Strength to Rupture Strength (100,000 hours)*

| | | | |
|---|---|---|---|
| A. At 900° F.: | | | |
| (1) Both steels | 48% | T.S. = | R.S. |
| B. At 1,000° F.: | | | |
| (1) 2 to 10% Cr | 25% | T.S. = | R.S. |
| (2) 0.5 to 1.5% Cr | 40% | T.S. = | R.S. |
| (3) Cr free steels | 10% | T.S. = | R.S. |
| C. At 1,100° F.: | | | |
| (1) 4 to 10% Cr | 20% | T.S. = | R.S. |
| (2) 0 to 3.5% Cr | 12% | T.S. = | R.S. |
| D. At 1,200° F.: | | | |
| (1) 2 to 10% Cr | 13% | T.S. = | R.S. |
| (2) 0 to 2% Cr | 6% | T.S. = | R.S. |
| E. At 1,300° F.: | | | |
| (1) 0-1.5% Cr | 3% | T.S. = | R.S. |
| (2) 3-6% Cr, 1.0 Mo | 12% | T.S. = | R.S. |
| (3) 6.5-10% Cr, 1.0 Mo | 8% | T.S. = | R.S. |
| (4) 2-10% Cr, 0.5 Mo, 1.0 Si min. | 12% | T.S. = | R.S. |
| (5) 2-10% Cr, 0.5 Mo, 1.0 Si max. | 7% | T.S. = | R.S. |
| F. At 1,500° F.: | | | |
| (1) All steels | 4% | T.S. = | R.S. |

R.S. = rupture strength (100,000 hours).
C.S. = creep strength (0.01%/1,000 hours).
T.S. = tensile strength at given temperatures.
*These factors based on results from 23 steels over the indicated temperature range.

Since the short-time tensile strength is likewise often used as a basis for design, the relationship between tensile strength and rupture strength is likewise included in this table. From this table it follows that with steels containing 1.5 per cent or more chromium, the relationship between creep strength and rupture strength is in general independent of the temperature but varies with the composition; while in the case of the rupture strength and tensile strength the relationship varies both with the temperature and composition.

## Short-Time Tests for Load-Carrying Ability

Different short-time tests have been advanced by various investigators for indicating the high-temperature load-carrying ability. As yet, the use of each of these tests is largely confined to the laboratory of its sponsor. A very distinct need still exists for a test of this type, not only for indicating the probable load-carrying ability of new analyses, but also to serve as an acceptance test in ascertaining if a given heat of steel possesses the properties claimed for it. It is believed that the most suitable test of this type should be one as simple as possible and one whose results can be the least open to question.

Many of these tests, such as Hatfield's time yield, Pomp and Dahman, Rohn and the German DVM methods, are based on creep rates in the early part of the first stage of creep. Our experience has been that identical specimens are more apt to differ in their first-stage behavior than after the creep rate has become fairly constant. This is probably true because internal adjustments and strain hardening occur during this stage and both are influenced by slight differences in the original specimen.

The standard and extended-time proportional limit tests have also been used to some extent, but both require the use of an extensometer system and a question always exists as this value may be greatly influenced by the sensitivity of the particular extensometer system employed. The Barr and Bardgett method also requires the use of an extensometer system and is therefore open to the same criticism as the preceding tests. Furthermore, this test is conducted under a decreasing stress condition which in service is encountered only in bolting applications.

The two methods which are believed to hold the greatest promise are the varying-rate tensile test

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and the short-time (up to 15 hours) stress-rupture test. Of these two, the stress-rupture test is believed to adapt itself more readily.

If the short-time rupture test is to be used either to indicate the load-carrying ability or as an acceptance test extended tests should first be run on a steel of the same general type in order to completely establish the time-rupture relationship. When this is once done then, referring to Fig. 6, the shorter-time tests can be used as follows. To investigate the influence of an increase in some element, such as molybdenum, on this type of steel, tests up to 15 hours could be conducted in simple dead-weight loading machines, or in a tensile machine. If the points fall above the lines of Fig. 6 it is reasonable to assume that the strength has been increased. If they fall below, the strength has been lowered.

If the test is to be used to determine whether or not a new heat of the 4-6 Cr Mo plus Si steel possesses the properties claimed for it at some temperature, such as 1,200° F., then from Fig. 6 it is seen that at this temperature a stress of 13,000 lb. should produce fracture in 8 hours. A specimen from the new heat could be subjected to this same stress and the fracture time determined. While this procedure may have certain limitations it is certainly better than judging the acceptance of high-temperature steels on the basis of room-temperature physical properties only, or on the more sensitive and more difficult-to-obtain creep rates.

### Characteristics Other Than Load-Carrying Ability

In addition to possessing sufficient strength, a steel must have certain other characteristics if it is to render satisfactory high-temperature service. It must have sufficient surface stability to withstand the attack of the media to which it is to be subjected and sufficient structural stability so that it will be able to retain both its original room and high-temperature characteristics to a satisfactory degree under the combined influence of time, temperature and stress.

*Surface stability.*—For the majority of high temperature applications surface stability implies resistance to corrosion and resistance to oxidation. It is not possible to draw a sharp line of demarcation between oxidation and corrosion but oxidation implies that oxygen is the chief offender in the attack while corrosion implies that the attack is caused by some element, or elements, other than oxygen.

*Corrosion resistance.*—No suitable laboratory test has as yet been developed for indicating a steel's resistance to corrosion. This is true not only because it is impossible to reproduce the commercial conditions on a laboratory scale, but also because the complete conditions are not always completely known. Furthermore, the corrosion resistance is dependent on temperature, pressure and velocity.

It is necessary therefore to ascertain the relative corrosion resistance of steels from service tests. In many of these, strip specimens are installed in the corroding media, such as with the A.P.I. strip-corrosion specimens. Many now question these results since stress is not present and available data indicate that this may be a very important factor. The best and most valuable results can be obtained only by actually installing the steel in trial installations.

*Oxidation resistance.*—In the laboratory, relative oxidation resistance of steels is determined by heating specimens in air and it is preferred that these tests be conducted for at least 1,000 hours. Results from laboratory tests of this type are shown in Fig. 13. Again, however, results from tests of this type may be criticized on the basis that stress is absent.

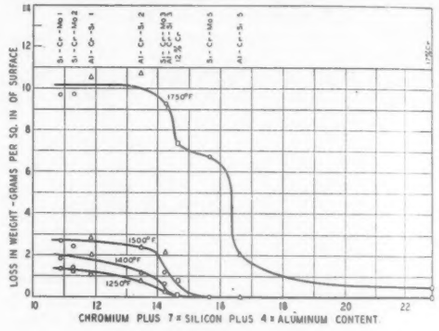


*Fig. 13—Relationship between oxidation resistance and chromium plus seven times silicon plus four times aluminum content*

A metallographic examination of the more prolonged rupture specimens affords a very convenient method for evaluating the oxidation resistance of steels in the presence of stress. For example, the microstructures of Fig. 11 show the higher-silicon 4-6 Cr Mo steel to have a very high resistance to oxidation at temperatures up to 1,500° F., while the standard 4-6 Cr Mo steel scales badly at 1,200° F.

In considering the results obtained from laboratory oxidation tests it must be recognized that the oxidizing conditions may be less severe than those to be encountered in service and suitable allowances must be made. Available information indicates that steels will in general retain their same relative order of merit under both conditions. That is, the steel which is outstanding on the basis of laboratory tests will also possess the best resistance in service.

*Structural stability.*—Lack of structural stability is generally manifested by carbide precipitation, spheroidization, structural transformations, temper embrittlement and intergranular oxidation and

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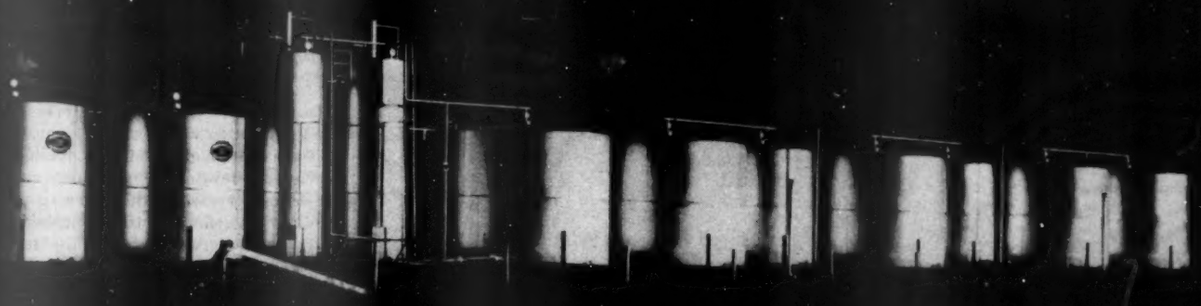

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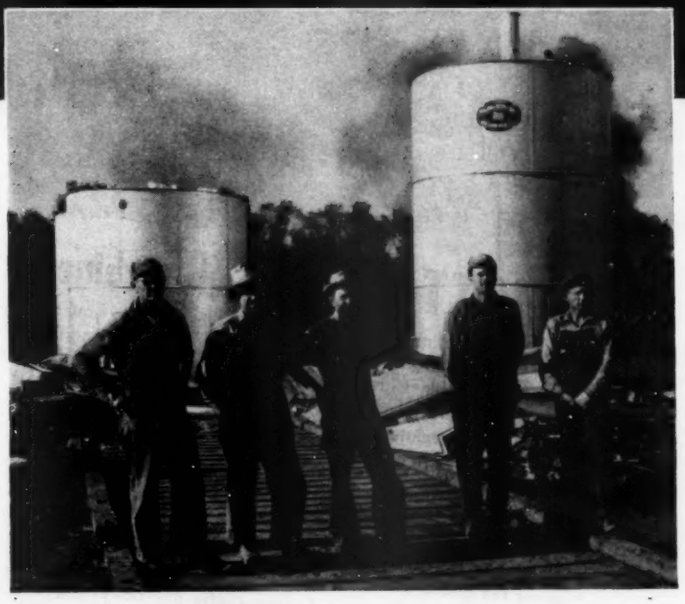

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corrosion. Information on these can be obtained from the proper laboratory tests.

*Carbide precipitation.*—This is more often encountered in steels of the austenitic type, such as 18-8, and is generally due either to the precipitation of chromium carbides at the grain boundaries or to the transformation at the grain boundaries of the unstable gamma iron into the alpha form. It can be readily detected by a metallographic examination of either the completed creep or stress-rupture specimen.

When this condition does arise the oxidation and corrosion resistance at the grain boundaries is decreased and intergranular attack occurs. It can best be eliminated by carefully controlling the operating temperature or by the addition of elements, such as columbium or titanium, which have a greater affinity for carbon than chromium and which form very insoluble carbides.

*Spheroidization.*—This is a change in the carbide phase from a laminated to a spheroidal form. It reduces the strength both at room and elevated temperatures and can best be determined by a metallographic examination of the completed creep or stress-rupture specimens. It is influenced by temperature, time and stress.

Steels containing about 1.5 per cent or more of chromium are in the spheroidized state in the condition in which they are commercially supplied and consequently are not as subject to this phenomenon although the degree of spheroidization may increase somewhat during service.

*Structural transformation.*—If changes of this type are observed in a steel after service, it implies that the steel was heated above the critical range during operation and is thus an indication of the maximum operating temperature. The after effects are not serious unless the steel has pronounced air-hardening characteristics and the cooling rate was sufficiently rapid to cause hardening.

*Temper embrittlement.*—There are still arguments as to whether or not temper embrittlement should be considered as due to structural instability. Many now believe this phenomenon to be caused by a precipitation, possibly submicroscopic, of some type. If this is true, then it must be regarded as an indication of structural instability.

In the laboratory, susceptibility to temper embrittlement can best be determined by impact tests on the completed creep specimens for stress may be a factor in producing this phenomenon.

*Intergranular oxidation.*—The susceptibility of a steel to this type of attack can best be determined by a metallographic examination of the surface of the more prolonged rupture specimens. A good example of this type of attack was shown in Fig. 12.

## Conclusions

In this paper attempts have been made to show the information which should be available in order to insure a given steel will render satisfactory service at elevated temperatures and to indicate the laboratory tests which are in use for determining these characteristics. Strength is only one of the necessary properties for it merely tells the stress the steel is capable of withstanding. The surface and structural stability reveal the length of time the steel will be able to carry this stress. As also shown, certain other properties such as freedom from temper embrittlement, the ability to retain the original properties under the service conditions, and the retention of a high degree of hot ductility are of great importance.

Certain of the short-time methods for indicating load-carrying ability were briefly discussed, but none of them have as yet been generally accepted. A great need still exists for a test of this type, both in the evaluation of steels and to serve as an acceptance test. This test should be as simple as possible, both with respect to the equipment required and the procedure involved. The results should be such that there is no question about their interpretation. The stress-rupture test seems to be the best short-time method for indicating load-carrying ability.

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## BOOK REVIEW

*"WELDING METALLURGY," by Otto H. Henry and G. E. Claussen, Price $1.50.*

Recognizing the need for a brief textbook on the A, B, C's of metallurgy and the metallurgical problems in welding, the New York section of the American Welding Society sponsored a series of lectures on these subjects. They were prepared by Prof. Otto H. Henry of Polytechnic Institute of Brooklyn and Dr. G. E. Claussen of the same university, who is also connected with the welding research committee.

The lectures are reproduced in attractive booklet form, copiously illustrated—357 pages—with imitation black leather covers. Volume 1 consists of the first series of 10 lectures given by the New York section in cooperation with the Polytechnic Institute of Brooklyn in 1939. Volume 2 includes the series of lectures given in 1940.

Volume 1 consists of: Temperature changes during welding, types of steels and their manufacture, crystals, how crystals grow from other crystals, why crystals are strong, the weld melt (pure iron), the weld melt (steel), the iron—iron carbide equilibrium diagram, difficulties, the solid weld, rate of cooling, alloy steels, metallurgical constants. Volume 2 consists of: Heat and time in welding, the weld during cooling, brittleness and cracking, shrinkage, fluxes and slags, alloy steels, stainless steels, preheating and stress relief.

The book is available at a price of $1.50 per copy from the American Welding Society, 33 West Thirty ninth Street, New York.

# QUESTIONS ON TECHNOLOGY

By W. L. NELSON, TECHNICAL EDITOR

## Vaporization From Buried Butane Tank

**I am interested in determining whether the ground can transmit sufficient heat under the prevailing conditions (Kansas City) to an underground tank of butane to supply the latent heat necessary to vaporize liquid butane without resorting to an artificial vaporizer?—D. W.**

The amount of heat that can be diverted from soil is governed by so many variables, particularly the kind of soil, amount of moisure in it, or its thermal conductivity, that only an approximate answer can be given. An idea of the complexity of the situation may be gained from the item entitled, "Cooling Gas by Coils in Ground," which appeared in the October 3, 1940, issue of The Oil and Gas Journal.

Butane in a tank is a somewhat different situation than that discussed in the above item, and hence the rate of heat transfer will be about 0.4-0.6 B.t.u. per sq. ft. of surface per hour per degree (F.) of temperature difference between the soil and the butane. If the tank is maintained at a pressure of 1 lb. per sq. in. gage, the boiling point of the butane or temperature in the tank will be about 35° F. and will be increased if the pressure is increased. The soil temperature will vary throughout the year but at a depth of 4 ft. might be of the general magnitude of 50° F. during the coldest months. If these conditions are correct, the transfer of heat per square foot of surface would be about 7 B.t.u. per hour. Thus, about 25 sq. ft. of surface would be required to cause the vaporization of 1 lb. of butane each hour (about 6.5 cu. ft. per hour).

In the summer the situation would be somewhat better but of no great practical significance. The rate of generation could be controlled by adjustment of the pressure. During all parts of the year except the winter, the rate of gas generation would probably be adequate for most household demands, but during the coldest winter months the rate of gas generation might be low.

## Glycerin From Petroleum

**What kind of crude oil is required for making glycerin and how is it made?**

The general lack of knowledge of the layman concerning the science of chemistry leads to many misunderstandings. Glycerin has been made on an experimental scale of production, from propylene gas—and propylene is one of the thousands of chemical compounds that is produced in small amounts during the processing of petroleum. Propylene may also be made from the propane gas that is found in natural gas. Thus, glycerin can be said to be indirectly made from petroleum.

The process of manufacturing glycerin from propylene involves several somewhat complicated chemical reactions and hence the following references should be examined: E. C. Williams, Chem. and Met. Eng., p. 834, December 1940 (or Transactions of the Am. Inst. of Chem. Engrs., Vol. 36); and, Groll and Hearne, Ind. Eng. Chem., Vol. 31, p. 153, 1939. Various steps in the processing are covered by United States patents. At the present time the process is being conducted in a semiplant-scale experimental equipment in the research laboratories of the Shell Development Co., but the development is said to be at such a stage that it can be put into full-scale commercial operation at any time.

Fundamentally, the following series of primary chemical reactions illustrate the process:

$$\underset{\text{Propylene}}{CH_2{:}CH{\cdot}CH_3} \xrightarrow[\text{Chlorine}\ 500^\circ\text{C.}]{Cl_2} \underset{\text{Allyl chloride}}{CH_2{:}CH{\cdot}\overset{\overset{Cl}{\cdot}}{CH_2}} \quad (1)$$

$$\underset{\text{Allyl chloride}}{CH_2{:}CH{\cdot}\overset{\overset{Cl}{\cdot}}{CH_2}} \xrightarrow[\text{Sodium Hydroxide}]{NaOH} \underset{\text{Allyl alcohol}}{CH_2{:}CH{\cdot}\overset{\overset{OH}{\cdot}}{CH_2}} \quad (2)$$

$$\underset{\text{Allyl alcohol}}{CH_2{:}CH{\cdot}\overset{\overset{OH}{\cdot}}{CH_2}} \xrightarrow[\text{Hypochlorous acid}]{HOCl} \underset{\text{Monochlorohydrin}}{\overset{\overset{OH}{\cdot}}{CH_2}{\cdot}\overset{\overset{Cl}{\cdot}}{CH}{\cdot}\overset{\overset{OH}{\cdot}}{CH_2}} \quad (3)$$

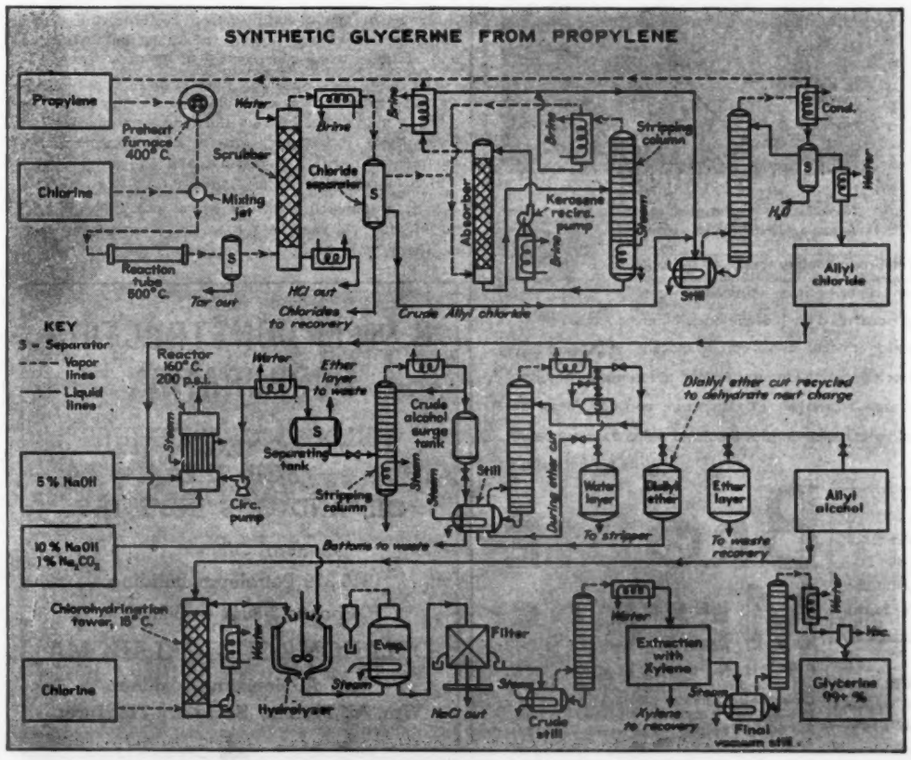
$$\underset{\text{Monochlorohydrin}}{\overset{\overset{OH}{\cdot}}{CH_2}{\cdot}\overset{\overset{Cl}{\cdot}}{CH}{\cdot}\overset{\overset{OH}{\cdot}}{CH_2}} \xrightarrow[\text{Sodium hydroxide and carbonate}]{NaOH\ Na_2CO_3} \underset{\text{Glycerin}}{\overset{\overset{OH}{\cdot}}{CH_2}{\cdot}\overset{\overset{OH}{\cdot}}{CH}{\cdot}\overset{\overset{OH}{\cdot}}{CH_2}} \quad (4)$$

The feasibility of the process may be attributed primarily to the discovery of the advantages of high-temperature chlorination as used in Step 1, and the use of mixtures of sodium hydroxide and carbonate in Step 4. The later innovation permits much higher yields than the use of sodium hydroxide alone. It is necessary, however, to control all steps in the process with extreme care, and the complexity of the manufacturing operations is more than the four fundamental steps shown above would indicate.

The flow diagram shown on this page indicates the many auxiliary operations of recovery and purification of intermediate and finished materials. During the chlorination (Equation 1), hydrochloric acid and undesired chlorides are produced. These are removed by scrubbing with water and by stratification of the raw chloride mixture. Some gases are also produced and the allyl chloride contained in them must be recovered by an absorption and steam stripping system which utilizes kerosene as the absorption liquid. Finally the crude allyl chloride is purified by distillation.

The second step is accomplished by the use of a dilute caustic solution. The dilute allyl alcohol so produced contains some undesirable ethers which are separated by stratification, and the alcohol is stripped from the dilute solution by means of steam stripping. Again, distillation is used to purify the crude allyl alcohol product. Impurities consisting of water, recoverable diallyl ether, and useless ethers are eliminated.

The chlorohydrination operation and the hydrolizer operations are relatively simple, but the purification of the crude glycerin necessitates two distillations (one under vacuum) and an extraction with xylene. The flow diagram was taken from Chem. and Met. Eng., December 1940.



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# Pipe-Line Activity

## Stanolind Lets Contract to B. and M. Construction Corp.

Stanolind Pipe Line Co. let a contract last week to B. and M. Construction Corp. for lines to be laid in connection with the company's program for filling in between loops of the trunk-line system. The whole program calls for looping the main line from a point near the Nocona station in North Texas to Whiting, Ind. The work to be done by B. and M. Construction Corp. is the first step toward carrying out the company's plans for filling in between loops so as to provide three complete lines for handling three grades of crude from Texas to northern refineries. Contracts for the remainder of the work will be let later in the year.

The contract awarded to B. and M. Construction Corp. is for approximately 74 miles altogether. This consists of 31 miles of 8-in. and 9 miles of 12-in. between Rogers Junction and Fox Junction in North Texas and southern Oklahoma, as well as 26 miles of 8-in. and 8 miles of 12-in. between County Line Junction and the South Canadian River, southern Oklahoma. Work will start when weather is favorable; it is expected that this may be some time next month or possibly as late as April. The work is to be completed in the first half of June.

## Ajax Will Move Pump Station And Pipe Near St. Charles, Mo.

Ajax Pipe Line Co. received bids early this week for work to be done in moving pipe-line facilities in the vicinity of the TNT plant which the Government is building near St. Charles, Mo. The work includes taking up 10 miles of double 10-in. line and laying 23 miles of double 10-in. line. The pipe taken up will be salvaged for later use; the pipe put in the ground will be new pipe. It will be necessary to move the pump station in this locality. At the present time the company is undecided as to whether the station will be rebuilt at another location in the vicinity. Since the line is operating considerably below capacity, it is believed that this pump station will be removed entirely and that it will not be rebuilt in that area. The nearest pump stations on the line are at a distance of 45 miles. The station near St. Charles consists of three 500-hp. diesel-engine-driven reciprocating pump units, each having a capacity of 32,500 bbl. The line and stations were constructed in 1930.

The TNT plant near St. Charles has been planned so that the location is on a block of 14,000 acres. The plant is placed a mile from the fence surrounding the reservation. It is being constructed by Ordnance Department, United States Army, and on completion it will be operated by Atlas Powder Co.

It is anticipated that the work of taking up pipe on one line will start before starting construction work on the new right-of-way. At present the Government has not accepted options for land in the area which includes the Ajax property, due to a matter which must be settled in regard to the payment of certain fees claimed by those obtaining the options. According to government plans, the work should start within 45 days after the receipt of payment for the undertaking. It is reported that a decision will likely be reached this week which will determine when this project will be started.

## Survey for Gas Pipe Line Is Conducted in Kentucky

Construction of a 190-mile pipe line, linking eastern Kentucky gas fields with already existing pipe lines in northern West Virginia is a possibility.

Kentucky & West Virginia Gas Co. is planning a preliminary survey for construction of a pipe line from Floyd County, Kentucky, to tie into the Pittsburgh & West Virginia Gas Co. lines in the northern part of West Virginia. It is reported that construction work will be handled by Equitable Gas Co., which is affiliated with the other two companies.

The national-defense program will be the main factor in the proposed pipe line, as the local sources indicated construction would rest on the steel industry's need for additional gas for use in producing defense materials.

"It would be a matter of the steel industry needing more gas in large quantities in an exceptionally short time," was the explanation given but it was emphasized that construction of the pipe line would not begin unless the demand for additional gas was apparent.

## East Ohio Pipe Line System Adds Liquefied Gas Plant

The pipe-line facilities of East Ohio Gas Co. were rendered more effective when the company recently put into operation the liquefying gas plant at Cleveland, Ohio, which was rushed to completion at a cost of $1,200,000. Some details of the project, such as painting and decorating, remain unfinished, but the plant itself has been tested, and is already supplying Cleveland with an extra supply of gas.

J. French Robinson, president of East Ohio, said the experiment was more than fulfilling expectations and that the entire industry was interested in the performance of the plant, which is the only one in the world.

During previous winters, when severe cold set in, the pipe-line system of East Ohio Gas Co. was unable to meet all demands. It was necessary for the company to deny fuel to its large wholesale customers, thus shutting down industrial production.

Due to the general mildness of the present winter, the ordinary facilities of the utility have been able to meet all demands, and now, with the new plant in

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## *Pipe-Line Personalities . . . . . A. N. Horne*

A. N. HORNE, manager, Empire Pipe Line Co., Bartlesville, Okla., grew up in the vicinity of Meridian and Jackson, Miss. In 1918, after graduating with a degree of bachelor of science in electrical engineering from Mississippi State College, (at that time it was Mississippi A. & M.), he attended officers training school at Leon Springs, Tex. He served in the tank corps as first lieutenant. On leaving the Army he entered the electrical department of a Cities Service subsidiary in Mississippi. Six months later he became a student engineer in the Empire organization at Bartlesville, Okla., and served in different departments before he was assigned to a permanent position in the oil pipe-line department where he first worked as timekeeper at Okmulgee, field gager at Covington, Okla., and El Dorado, Kans.

In 1922 he became district superintendent at Duncan, Okla., and Burkburnett, Tex. The next year he was transferred to the Ponca City and Cushing, Okla., district. He was promoted to superintendent of operations of the entire oil pipe-line system in 1927, and 2 years later was advanced to general superintendent. In 1937 he attained his present position as manager of Empire Pipe Line Co., and manager of storage of Cities Service Oil Co. He is also vice president and director of the two Texas-Empire Pipe Line companies and Kaw Pipe Line Co. as well as director of Texas-New Mexico Pipe Line Co.

Mr. Horne has served continuously in the U. S. Army Reserve since the last war and is a captain in the 377th Infantry with a record of regular attendance at camp at Fort Sill, Okla. He is a member of American Society of Mechanical Engineers. This year he is president of the Rotary Club of Bartlesville. His hobbies are gardening, a home work shop, and photography.

operation, the threat of shutdowns is eliminated and all-important defense production is safe from work stoppages.

Principal feature of this new plant is that it makes possible something the industry has long sought: a practical means of storing a large amount of natural gas for use in emergencies.

Cleveland has an average daily gas consumption of 80,000,000 cu. ft. and much more than that during the winter. A huge storage tank, the size of a city block, would hold only about 1,000,000 cu. ft. of gas in its natural state. Such storage was not only inadequate but too expensive and too dangerous.

By the newly developed liquefying process, however, 600,000,000 cu. ft. can now be stored in the same space as heretofore required for 1,000,000 cu. ft. To meet Cleveland's emergency demands, East Ohio has erected three small spherical tanks, each to contain 50,000,000 cu. ft. in liquid form.

The technical process involves compressing the natural gas from 30 to 600 lb. pressure and then liquefying by cooling to 250° below zero. The tanks are filled during days of low demand. When the demand is doubled or tripled on extremely cold days, the fuel is regasified by heat and pumped back into the company's lines.

According to The Lamp, official publication of Standard Oil Co. (New Jersey):

"It is not too early to predict that within a reasonable time similar liquefaction plants will be established near the outskirts of many large natural-gas-consuming centers, where sharp fluctuations in demand are experienced during the winter months and which otherwise would have to be taken care of by large additional investments in pipe-line facilities which would be in use only during short periods of the year."

### Wabash Obtains Permit For Line to Centerville, Ill.

The Wabash Pipe Line Co. (Pure Oil Co.) has been granted permit to construct a line from Calvin to Centerville in White County, Illinois. The line is approximately 9 miles in length and will be 4 in. in size. The Illinois Pipe Line Co. has a terminal at Centerville and will transport the oil eastward.

Pure Oil Co. has approximately 3,000 bbl. daily production in the area to be served by the line. Total production of the company in Illinois amounts to almost 36,000 bbl. daily. The company operates two refineries to which the oil is shipped, one at Toledo and the other at Heath, Ohio.

### Humble Reconditions Lines in Corpus Christi, Tex., Area

O. C. Whitaker Co. has a gang working in the Corpus Christi, Tex., area which has been carrying on reconditioning work on crude-oil lines of the Humble Pipe Line Co.'s system. This gang has been engaged on this program since last August. All of the work has been done in the Corpus Christi area except for a job which took about a month on Humble lines near Devine, Tex. Altogether, approximately 100 miles of line has been reconditioned; this has been done on sections at various points on the company's system.


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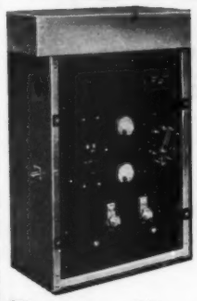

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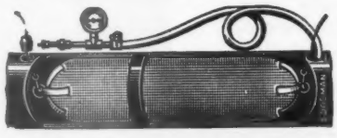

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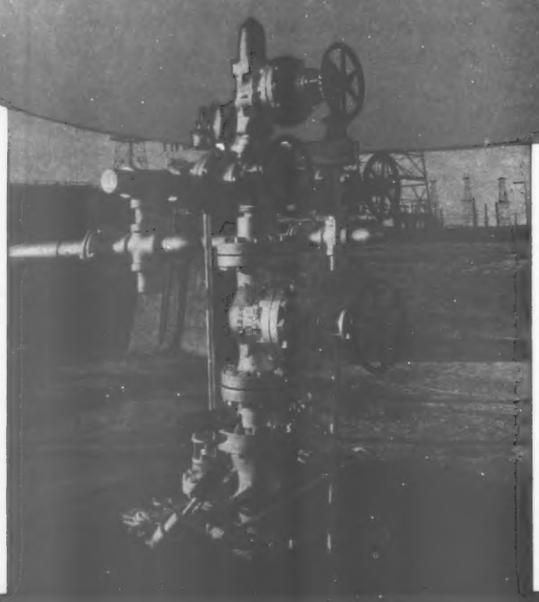

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# FIELD DEVELOPMENTS...

## HIGHLIGHTS FROM THE WEEK'S NEWS—

With the completion of 491 wells during the last week, completions remain on the same level as in 1940. Oil wells increased 40 over last week and gas wells and dry holes were each down three. Although drilling is at the same level as during 1940, there are several signs that distribution of activity is not only on a more uniform basis, but also that the results of drilling are placing the petroleum industry in a better position. Last year, discoveries did not equal production and drilling activity was concentrated largely in Illinois and the eastern fields. The former activity led to a rapid rise in production to a point where other states suffered considerable loss of market and now that the market has adjusted itself to more production from Illinois, the production is not available and the deficiency must be met from other states. North Texas, Kansas and Wyoming have all shared in the improved market and are developing new production to take care of the increased demand.

The widespread discovery of new production, mainly in areas where there is efficient control is also a good sign. This week it is announced that Michigan may have its first important new field in 2 years. From Pennsylvania comes the report that Trenton production has been found in Erie County. The Trenton pay at Salem looks better although not sufficiently rich to precipitate a drilling spree which will unsettle markets. Everywhere through the East the search for gas is being vigorously conducted as new industries demand this efficient fuel.

Although the Forest City basin play has subsided into the development of the not-too-important Falls City field, many of the operators who rushed into that area are finding other prospects farther north and west. The Salina basin of North Kansas and South Nebraska is getting a play and the Barton arch structures are being tested farther and farther from old pools.

In Texas, drilling is proceeding steadily ahead without spectacular finds but the Wilcox trend play continues to uncover new reserves, offshore structures contribute important discoveries and there is a steady growth in known deep pays which will serve to maintain a constant stream of oil from coastal fields to the refineries for many years.

**MICHIGAN:** One of the biggest producers in the state's history, a 5,280-bbl. well, was completed in the Adams field, and another made 1,720 bbl. A discovery which may be the most important in 2 years was made in the Traverse lime in Oceana County. On the other side of the picture, three tests were abandoned in Huron County and wildcats in St. Joseph and Kalkaska were also dry (p. 120).

**WEST CENTRAL TEXAS:** Climaxing a very profitable week, a new field discovery and a new deeper horizon discovery were recorded in Jones County. Two new wildcats were staked in Jones County, as well as wildcats in Hamilton, Brown and Shackelford counties (p. 104).

**SOUTHWEST TEXAS:** A new Pettus sand pool has been opened near Normanna, Bee County. The second well in Willamar missed the main pay but picked up another sand. Recent discoveries in the basal Frio have opened up possibilities for greatly increased reserves in this formation (p. 103).

**TEXAS GULF COAST:** After West Ranch and Lolita had made Jackson County one of the most important in the coastal region, prospectors became active. As a result, La Ward was brought in a few weeks ago and two sands were picked up last week in a wildcat near Edna. The Halls Bayou discovery in Brazoria County is in the final stages of completion. Two additional sand formations in the Wilcox have been opened up in the Magnolia discovery, Montgomery County (p. 109).

**CALIFORNIA:** Wildcatting is very definitely on the increase, particularly in the San Joaquin Valley and Newhall-Castaic districts. The strong position of fuel oil is encouraging the search for heavy grades of unrefinable crude (p. 100).

**PENNSYLVANIA:** What may turn out to be an important discovery was made in Erie County when a rank wildcat encountered showing of light green oil in the Trenton at 4,437 ft. This is the first Trenton oil to be found east of the Cincinnati arch fields in Ohio and Kentucky and may cause a revival of the deep-sand play in eastern Ohio (p. 108).

**LOUISIANA GULF COAST:** The discovery well at St. Gabriel, Iberville Parish, is a 250-bbl. well. Interest is now centered on the Wilcox tests in Glenmora, Rapides Parish, and Basile, Evangeline Parish. Both wells are running high (p. 118).

**WYOMING:** The state senate's action in rejecting a measure permitting the state to join the interstate oil compact may prove a serious setback to state control of the oil industry. Production is on the upswing and the legislators feel that Wyoming can do better under competition than if production is prorated (p. 121).

**WEST TEXAS:** Activity in the Abell field of northern Pecos County topped the week's development as three tests were bottomed in saturated Simpson pay and preparing to complete. As yet there is only the discovery well in the field, however, the three new wells will extend the area a mile to the north and a mile to the west (p. 96).

**NORTH TEXAS:** The deep exploration of the Fort Worth basin has declined somewhat during the past few months, however, it was vigorously bolstered the past week with the staking of six new exploratory tests in as many counties. The deep wildcat test just outside the city of Fort Worth in Tarrant County appears to be a failure as a possible gas zone tested barren (p. 104).

**EASTERN TEXAS:** The prospective 1-mile west extension to the Hawkins field which appeared in prospect 2 weeks ago, has been declared a failure in the Woodbine sand and is going ahead to the Paluxy sand. This now limits the newest Woodbine sand field on three sides by failures and on the fourth by a small pumping well, the original discovery (p. 114).

**LA-ARK-TEX:** North Louisiana's deepest test, north of Lisbon, found a gas pay at 10,353-11,834 ft. (p. 95).

**OKLAHOMA:** Bad weather is delaying testing of Oklahoma's expected major Wilcox strike in Logan County (p. 99).

## COMPLETIONS IN ALL FIELDS . . .

(Week ended February 22, 1941)

| | Oil | Gas | Dry | Total | 1941 total comp. to date | 1940 total comp. to date |
|---|---|---|---|---|---|---|
| N. Y., Pa., and W. Va. | 37 | 19 | 7 | 63 | 634 | 539 |
| Ohio | 0 | 11 | 3 | 14 | 187 | 107 |
| Indiana | 5 | 1 | 4 | 10 | 57 | 43 |
| Kentucky | 2 | 2 | 2 | 6 | 82 | 48 |
| Illinois | 35 | 0 | 17 | 52 | 405 | 481 |
| Michigan | 10 | 1 | 15 | 26 | 133 | 177 |
| Kansas | 25 | 0 | 6 | 31 | 229 | 174 |
| Oklahoma | 15 | 5 | 13 | 33 | 209 | 225 |
| Nebraska | 0 | 0 | 0 | 0 | 13 | 0 |
| Texas: | | | | | | |
| North Central Texas | 34 | 1 | 16 | 51 | 360 | 415 |
| West Texas | 32 | 0 | 2 | 34 | 269 | 284 |
| Texas Panhandle | 15 | 2 | 0 | 17 | 71 | 87 |
| Eastern Texas | 1 | 1 | 4 | 6 | 164 | 133 |
| Texas Gulf Coast | 20 | 1 | 1 | 22 | 139 | 189 |
| Southwest Texas | 22 | 2 | 16 | 40 | 211 | 301 |
| Total Texas | 124 | 7 | 39 | 170 | 1,214 | 1,409 |
| North Louisiana | 4 | 0 | 3 | 7 | 89 | 83 |
| Louisiana Gulf Coast | 10 | 1 | 3 | 14 | 113 | 107 |
| Total Louisiana | 14 | 1 | 6 | 21 | 202 | 190 |
| Arkansas | 0 | 0 | 0 | 0 | 23 | 31 |
| Mississippi | 2 | 0 | 0 | 2 | 26 | 16 |
| Montana | 1 | 7 | 2 | 10 | 45 | 22 |
| Wyoming | 3 | 0 | 0 | 3 | 22 | 24 |
| Colorado | 2 | 0 | 1 | 3 | 5 | 5 |
| New Mexico | 3 | 0 | 0 | 3 | 47 | 91 |
| California | 12 | 0 | 2 | 14 | 168 | 150 |
| Total United States | 290 | 54 | 117 | 461 | 3,701 | 3,732 |
| Total previous week | 280 | 57 | 120 | 457 | | |
| Week ended Feb. 24, 1940 | 366 | 32 | 107 | 505 | | |

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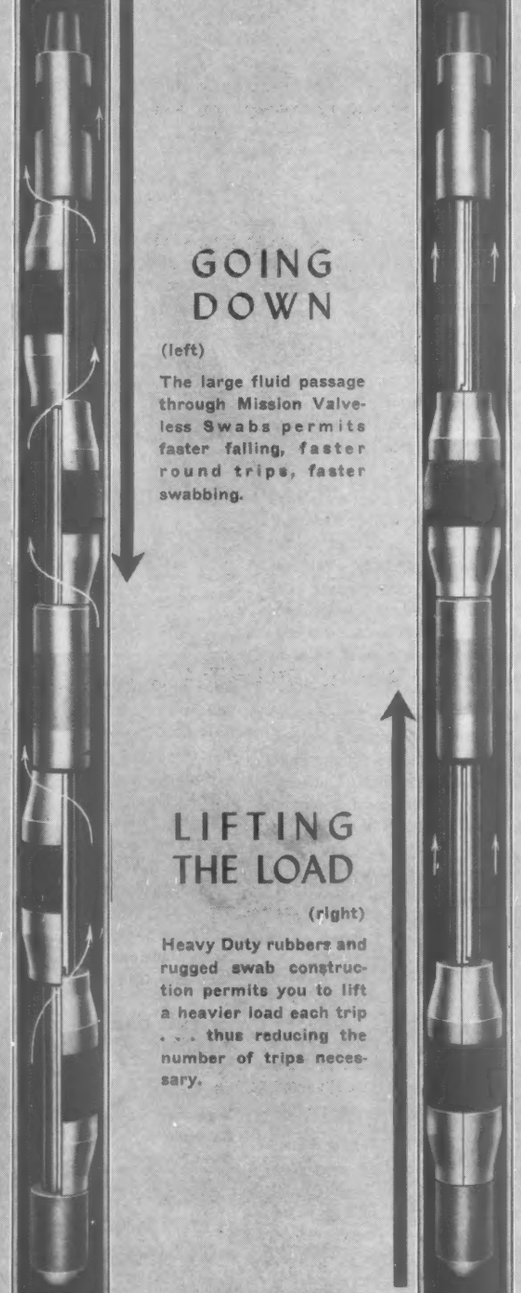

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# North Louisiana Deepest Well Near Lisbon Shows Gas

By GEORGE WEBER

SHREVEPORT, La., Feb. 24.—A showing of gas in the deep Union Producing Co. 1-A Meadows, north of Lisbon, resulted from the first production test on the deepest well yet drilled in North Louisiana. The wildcat, bottomed at 11,834 ft., was drill-stem tested between 10,353 ft. and bottom last week, using ¼-in. chokes, top and bottom. In 2 hours, 87 stands of mud and approximately 1,000,000 cu. ft. of sweet gas were tested. Operators plugged back to the 7-in. casing seat at 10,393 ft. and are preparing to perforate casing between 10,148 and 10,393 ft. with 650 shots at four levels. The test may be acidized after perforating. The Smackover lime was topped at 10,270 ft. and the test is bottomed in salt.

## Wilcox Play

The southern La Salle Parish wildcat, Louark 1 Tensas Delta Land Co., is attracting attention with reports of running favorably high. To the northwest, near Georgetown, Lion 1 Goodpine, western La Salle Parish, is drilling below 3,570 ft. after finding the Olla zone shaled up. The test recovered nine stands of oil cut with gas, and four stands of salt water in the top of the Wilcox last week. Seven wildcats are active in the area, drilling in Catahoula, Grant, La Salle and Madison parishes.

## SUMMARY OF COMPLETIONS

*North Louisiana*

| | No. | Bbl. | Depth |
|---|---|---|---|
| Oil wells: Olla | 2 | 245 | 4,752 |
| Nebo | 2 | 250 | 7,631 |
| Dry holes: Caddo | 1 | ..... | 1,042 |
| Olla | 1 | ..... | 2,975 |
| Wildcats | 1 | ..... | 6,104 |
| Total | 7 | 495 | 22,504 |

*East Texas Border*

| | | | |
|---|---|---|---|
| Gas wells: Waskom | 1 | *4.2 | 6,149 |

*Million cu. ft.

## Lisbon Gas Test

In the Lisbon field, the current Travis Peak test, Oakes et al 2 Sallie Lloyd tested about 1,000,000 cu. ft. of gas and 20 bbl. of condensate, with shut-in pressure of 2,000 lb. The perforated level tested was 5,420-30 ft., where an electrical survey showed production possibilities. The zone is in the transitional section in or above the top of the Travis Peak (Hosston) formation, where oil production has been discovered. Travis Peak was topped at about 5,415 ft.

### NORTH LOUISIANA COMPLETIONS

**Caddo—Caddo Parish**

A. R. Hancock 9 Helpman..... SE SW NE 16-21-16
T.D. 1,042 ft., dry, 6⅝-in. casing 1,028 ft.

**Olla—La Salle Parish**

Ark. Fuel Oil 1-C Kees ..... NE NW 7-10-3
Pumped 85 bbl., 5 per cent salt water, T.D. 2,357 ft., 7-in. casing 2,260 ft., perf. 2,188-2,202 ft., upper Central sand, Wilcox.
Placid Oil Co. 73 La. Central .....NE SE 2-9-2e
T.D. 2,975 ft., salt water.
Placid Oil Co. 82 La. Central ..... NW SE 30-10-3
160 bbl., 8 per cent salt water, 12/64-in. choke, T.P. 125 lb., T.D. 2,395 ft., 7-in. casing 2,395 ft., perf. 2,198-2,206 ft., upper Central, Wilcox sand.

**Nebo—La Salle Parish**

H. L. Hunt 12-A Goodpine .....SE NW 17-7-3e
Gas lift 125 bbl., 18 per cent salt water 12/64-in. choke, T.P. 125 lb., C.P. 370 lb., T.D. 3,899 ft., 7-in. casing 3,821 ft., perf. 3,395-3,402 ft., Wilcox.
H. L. Hunt 13-A Goodpine ..... SW NE 9-7-3e
125 bbl., 10 per cent salt water, 12/64-in. choke, T.P. 150 lb., C.P. 750 lb., T.D. 4,229 ft., 7-in. casing 3,867 ft., perf. 3,816-19 ft., Wilcox.

**Wildcat—Webster Parish**

H. L. Hunt 1 Pardee.....SE SW SE 36-22-10
T.D. 6,104 ft., temporarily abandoned.

### NORTH LOUISIANA DRILLING REPORT

**Bienville Parish**

R. W. Burnett 1 Locke.....NE NW NE 9-15-10
S.D. 1,100 ft.

**Bossier Parish**

R. L. Seese 1-A Bellevue Land Co...SW NE SW 27-20-11
10-in. 250 ft., drilling 1,321 ft.

**Catahoula Parish**

H. L. Hunt 1 Anderson et al.....SE SE 31-10-6e
Top Wilcox 2,845 ft., drilling shale 3,214 ft.

**Claiborne Parish**

Oakes et al 2 Sallie Lloyd.....SE SE 3-20-5
(Deep Lisbon), tested 1,000,000 cu. ft. gas, 20 bbl. distillate., S.I. pressure 2,000 lb., T.D. 5,473 ft.
Union Producing Co. 1-A Meadows et al....NE 18-21-4
T.D. 11,834 ft., D.S. test 10,353-11,834 ft., recovered mud cut with gas, P.B. 10,441 ft., testing.

**De Soto Parish**

J. E. Stack et al 1 Cook.....NW NE 32-13-14
S.D. 3,000 ft.

**Grant Parish**

Smith, Lloyd et al 1 Swope est.....SE NW 16-9-1e
10-in. casing 205 ft.

**La Salle Parish**

J. D. Crochett et al 1 Jones.....NW NW 41-7-3e
S.D. 3,963 ft.
Lion Oil Ref. Co. 1 Goodpine.....SW SW 25-9-1e
Drilling shale and sand 3,577 ft.
Louark Prod. Co. 1 Tensas Delta Land Co. ..... SW SE 27-6n-4e
Drilling shale 4,487 ft.
Placid Oil Co. 1-B Goodpine.....NE NW 33-9-2e
Drilling sandy shale 3,555 ft., top Wilcox 1,824 ft.

**Wildcat—La Salle Parish**

Big West Drlg. Co. 1 Whatley.....NE NE 25-8-2e
First report.
Placid Oil Co. 1 Tremont Lbr. Co.....NW SE 23-9-2e
First report.

**Lincoln Parish**

Herman Brown 1 Ark. La. Gas Co.....SW NE 11-17-4
Drilling hard shale 7,527 ft.

**Madison Parish**

H. L. Hunt 1 Lancaster, 385 ft. W, 340 ft. N, most easterly corner, Sec. 3-14-12e, coring 6,035 ft.

**Natchitoches Parish**

J. E. Watts 1 Tanner.....SW SW NW 18-10-10
T.D. 3,216 ft., waiting on straight reamer.

**Red River Parish**

Thornton & LaCroix 1 Prudential Life Ins. Co ..... SW SW NW 3-11-9
T.D. 1,317 ft., S.D.

**Wildcat—Sabine Parish**

Plummer & McDaniel 1 Phares....NW NW SW 4-5-12
First report.

## ARKANSAS

Attention is still centered on the C. H. Murphy 1-C Cates, 33-18-15, the deep Smackover lime test in the old El Dorado field of Union County. After coring oil shows in shallower sections, the test this past week continued to find more oil stain and asphaltic sands in the Cotton Valley formation. From 7,121 ft. to 7,131 ft., tight sand with some stain and odor was recovered, and at 7,210-19 ft., 2 ft. of asphaltic sand, showing pin points of oil, and 5 ft. of slightly porous sand with a salty taste. At the 7,587-97-ft. level, tight sand was recovered, the top section showing good oil odor, and the bottom 2½ ft. porous water sand. The test is being cored ahead below 7,730 ft. The Smackover lime was topped at 7,707 ft.

### ARKANSAS DRILLING REPORT

**Clark County**

W. S. King 1 McKenzie.....SE SE NW 30-10-19
S.D. 1,336 ft.

**Columbia County**

Crow Drlg. Co. (Turner & O'Ferrell) 1 Smart..... SW SW 12-15-20
(Deep Stephens test), T.D. 6,050 ft., P.B., 5½-in. casing 3,565 ft., perf. 3,417-25 ft., waiting on straight reamer.

**Faulkner County**

Cato Oil Co. 1 R. R. Harrell.....SE SW 35-4n-12w
Drilling 3,177 ft.

**Miller County**

Louark Prod. Co. 1 E. J. Hedrick et al ..... NE NE 27-19-27
13⅜-in. casing 249 ft., drilling 2,545 ft., top Nachatoch 2,545 ft.

**Nevada County**

Coker & Grieves 2 Guy Thompson. SE SE SE 35-10-22
S.D. repairs 847 ft.

**Ouachita County**

Berry Asphalt Co. 1 G. S. Martin SW NE SW 17-14-19
S.D. 2,356 ft., no showing, awaiting orders.

Frank J. Hughes 1 Rath & Cartier, Inc. ..... NE SW NE 35-13-18
Dirlling shale 1,659 ft.

**Prairie County**

Hazen Oil Co. 1 Fidelity Mutual.....NE SW 16-2n-6w
S.D. 700 ft.

**Sevier County**

Gramp Oil Co. 2 Phillips.....SW SW SW 26-9-30
Drilling shale 917 ft.

**St. Francis County**

U. S. Oil Corp. 1 Wilford.....NE SW NE 29-4n-1w
Set 7-in. casing 2,261 ft., T.D. 2,265 ft.

**Union County**

C. H. Murphy 1-C Cates.....NW SW 33-18-15
Coring 7,729 ft. (deep El Dorado test).

## AVERAGE DAILY PRODUCTION

**NORTH LOUISIANA**

| | Feb. 22 | Feb.15 |
|---|---|---|
| Caddo, light | 5,840 | 5,910 |
| Caddo, heavy | 1,970 | 2,050 |
| Cotton Valley | 13,950 | 13,920 |
| Cross Lake | 2,785 | 3,010 |
| De Soto and Red River | 980 | 1,010 |
| Haynesville | 2,570 | 2,620 |
| Homer | 2,780 | 2,775 |
| Lisbon | 2,800 | 2,810 |
| Nebo | 1,120 | 850 |
| Olla | 9,705 | 9,650 |
| Rodessa | 16,005 | 16,240 |
| Sarepta-Carterville | 295 | ..... |
| Sligo | 2,230 | 2,070 |
| Sugar Creek | 1,435 | 1,050 |
| Urania | 2,195 | 2,205 |
| Zwolle | 1,300 | 1,310 |
| Total North Louisiana | 69,740 | 69,655 |
| Rodessa, Texas | 15,755 | 15,775 |

**SOUTH ARKANSAS**

| | | |
|---|---|---|
| Atlanta | 2,500 | 2,500 |
| Buckner | 2,230 | 1,955 |
| Champagnolle | 1,200 | 1,200 |
| Dorcheat | 1,550 | 1,510 |
| El Dorado | 1,575 | 1,570 |
| Magnolia | 19,600 | 19,580 |
| McKamie | 1,225 | 1,225 |
| Nick Springs | 1,150 | 1,175 |
| Rodessa | 1,665 | 1,610 |
| Schuler | 16,450 | 16,440 |
| Smackover, light | 1,675 | 1,680 |
| Smackover, heavy | 13,450 | 13,440 |
| Troy | 1,150 | 1,135 |
| Urbana | 1,750 | 1,800 |
| Village | 1,025 | 995 |
| Total South Arkansas | 70,525 | 70,160 |

### EAST TEXAS BORDER COMPLETIONS

**Waskom—Harrison County**

Union Producing Co. 1-A Bryson, T. D. Wilson Sur., 4,200,000 cu. ft. gas, R.P. 2,337 lb., T.D. 6,149 ft.

### EAST TEXAS BORDER DRILLING REPORT

**Bowie County**

A. L. Willis et al 1 H. L. Taylor, John McGuire Sur., S.D. 4,000 ft.

**Marion County**

Henry King et al 1 W. G. Bailey, R. Maxwell Sur., S.D. 2,100 ft.
R. S. Kirby 1 Bergerson, Burton Sur., drilling 2,369 ft.
P. L. Withers et al 1 T. G. Allen, Robert Potter Sur., S.D. 2,350 ft., show oil.

**Sabine County**

Sturm & Womack 1-A Keith, L. Grace Sur., P.B. 2,974 ft., waiting on cement.

**San Augustine County**

B. F. Findley et al 1 G. W. Allen, A. N. Davis Sur., S.D. 450 ft.
Roper & Todd 1 Long Bell, N. Hayden Sur., S.D. 635 ft., repairs.

**Shelby County**

Cougar Oil Co. 1 Jones, John Latham Sur., set surf. casing 100 ft., drilling ahead.

## Well Spacing Halved in Ten Section Field

LOS ANGELES, Calif., Feb. 24.—Since the discovery of the Ten Section field, Shell Oil Co., Inc., drilled one well to each 20 acres. However, drilling costs have been greatly reduced and drilling time has been reduced to a minimum and Shell has found it advisable to deviate from its established practice by locating a new well that will mean two wells to each 20 acres or one well to each 10 acres.

# Three Abell Pool Wells Ready To Complete in Simpson

By R. MARNE SANFORD

MIDLAND, Tex., Feb. 24.—With only the original discovery well completed, three additional tests in the Simpson lime Abell field of northern Pecos County are bottomed in the pay horizon and preparing to complete within the coming few days.

Despite the fact that the completion of the three new wells would place the aggregate proven acreage figure of the field at about 500 acres, the old Magnolia and Tex-Mex Oil 1 McKee, failure would be located in the approximate north central part of the proven field. It is now definitely believed that the old failure would have made commercial production had not mechanical difficulties prevented final completion.

A mile north and slightly west of the discovery well, which is now Stanolind 1 Crockett since the recent purchase, the Magnolia 1 State-Sharp, SE cor. of Lot 9, Section 22, Block 9, H.&G.N. Survey, is bottomed at a total depth of 5,470 ft. in saturated Simpson lime and operator was preparing to core ahead in the pay. Some saturation was first found from 5,396 to 5,400 ft. The 7-in. casing is set at 5,465 ft.

On a line between this outpost and the discovery well the Magnolia 1 Markey heirs, Section 4½, Block 3, H.&T.C. Survey, is milling on tools lost in the hole at 5,401 ft. Prior to losing cable tools in the hole the test had headed oil several times to indicate a producer.

The third test preparing to start completion attempts is the Magnolia 1 State-Baldwin, about 1½ miles north and slightly east of the discovery well and about a mile east and slightly north of 1 State-Sharp. The State-Baldwin well is located in Lot 11, Section 24, Block 9, H.&G.N. Survey, and topped the pay section at 5,215 ft. It is bottomed at 5,220 ft. and is setting oil string at 5,212 ft. The old 1 McKee failure is located west of this test and between the 1 State-Sharp and the 1 State-Baldwin.

Meanwhile Sinclair Prairie has staked a new east outpost to the field with 1 E. E. Grove, 330 ft. from the south and 990 ft. from the east lines of Lot 9, in the SE cor. of Section 26, Block 9, H.&G.N. Survey. On the south end of the field Phillips Petroleum Co. is drilling below 3,200 ft. at 1 Silverman, NE cor. of Section 10, Block 3, H.&T.C. Survey, a south offset to the original discovery well. Another active test in the field is George T. Abell 1 Rixse, Lot 8, Section 25, Block 9, H.&G.N. Survey, about ½ mile south of 1 State-Baldwin. It is drilling below 1,773 ft.

## SUMMARY OF COMPLETIONS

| | No. | Bbl. | Footage |
|---|---|---|---|
| ***Southern West Texas*** | | | |
| Oil: Jordan field | 2 | 549 | 7,195 |
| Foster field | 2 | 859 | 8,455 |
| White & Baker field | 3 | 490 | 6,216 |
| O'Brien field | 2 | 804 | 5,422 |
| Keystone field | 2 | 500 | 6,793 |
| Waddell field | 1 | 8,783 | 3,505 |
| Other fields | 4 | 2,957 | 15,992 |
| Total | 16 | ..... | 53,578 |
| ***Northern West Texas*** | | | |
| Oil: Slaughter field | 5 | 3,084 | 25,126 |
| Seminole field | 3 | 2,113 | 15,919 |
| Wasson field | 7 | 5,885 | 36,417 |
| Other fields | 1 | 267 | 1,745 |
| Dry: Fields | 2 | ..... | 6,507 |
| Total | 18 | ..... | 85,718 |
| ***Texas Panhandle*** | | | |
| Oil wells: Carson County | 3 | 415 | 9,362 |
| Gray County | 4 | 424 | 12,674 |
| Hutchinson County | 6 | 3,925 | 18,169 |
| Wheeler County | 2 | 272 | 4,878 |
| Gas wells: Moore County | 2 | *407 | 6,204 |
| Total | 17 | ..... | 51,287 |
| ***Southeast New Mexico*** | | | |
| Oil wells | 3 | 565 | 10,249 |

*Million cu. ft.

## Crockett Discovery Finaled

Official completion has been registered for the long-testing discovery well in Crockett County by E. Wahlenmaier and associates on the George Bean ranch. The well, located 1,980 ft. from the north end and 1,960 ft. from the east lines of Section 48, Block UV, G.C.&S.F. Survey, 2½ miles south of the Todd Deep field, was finaled for 196¼ bbl. of oil in 22 hours, flowing. The well made 5 per cent basic sediment and water and an undetermined yet considerable gas volume. The oil pay was from 1,451-56 ft. and the gas zone was from 1,212-20 ft., flow valves being set 360 ft. and 500 ft. from the bottom of the hole. The oil pay was acidized with 1,000 gal. Operators will seek to obtain a new discovery allowable for the well and the name of Bean field for the new discovery. The well has been shut in due to lack of outlet.

## Foster Outpost to Be Reworked

Plans to let contract for cleaning out and reworking an old failure 3 miles south of the Foster field in Ector County were announced by John T. Cross, Fort Worth. He has purchased approximately 327 acres in the north part of Section 4, Block 43, Township 3s, T.&P. Survey, and also the old Ranger-Casteel-Stogner 1 Hendricks, a 4,330-ft. failure drilled in 1938. The operator has determined that the lime showing oil in the old test is about 98 per cent soluble in hydrochloric acid and plans to acidize. The old well showed for about 20 bbl. naturally. The test was correlated about 184 ft. higher, structurally, than a failure to the south.

### SOUTHERN WEST TEXAS COMPLETIONS

(24-hr. ratings based on last 3 hr. of 6-hr. gage)

**Crane County**

Waddell field: Gulf 37 Waddell, 8,783 bbl., tubing and casing, 5,000 gal. acid, 3,310-3,505 ft.
Sand Hills Permian field: Humble 2-D Tubb, 276 bbl., 21/64-in. choke, 7,000 gal. acid, 4,269-4,412 ft.
Jordan field: Texas 6-A University, 207 bbl., open tubing, 1,000 gal. acid, 3,557-3,600 ft.

**Ector County**

North Cowden field: Cities Service 13 Rhodes, 1,751 bbl., open casing, 350-qt. shot, 4,065-4,185 ft.
Jordan field: Cities Service 6-B University, 342 bbl., ¾-in. choke, naturally, 3,560-95 ft.
Foster field: Forest Development 3-A Moss, 379 bbl., 480-qt. shot, 4,030-4,200 ft.
Kewanee Oil 1 H. C. Foster, 480 bbl., open tubing, 1,090-qt. shot, 3,890-4,255 ft.
North Goldsmith field: M. A. Grisham 3 R. B. Cowden, 250 bbl., open tubing, 3,000 gal. acid, 4,260-4,457 ft.

**Pecos County**

White & Baker field: J. D. Lancaster 1 White & Baker, 140 bbl. oil and 210 bbl. water, 100-qt. shot, 2,070-2,104 ft.
Shasta Oil 1 White & Baker, 213 bbl., open tubing, 100-qt. shot, 2,040-70 ft.
Shasta Oil 2 White & Baker, 227 bbl., open tubing, 100-qt. shot, 2,012-42 ft.

**Ward County**

North Ward field: Atlantic and Standard 1 University, 352 bbl., 8 per cent water, 13½ hr., ⅝-in. choke, 2,920-39 ft.
O'Brien field: Gulf 142 Estes, 448 bbl., open tubing, 270-qt. shot, 2,545-2,649 ft.
Gulf 161 O'Brien, 356 bbl., open tubing, 630-qt. shot, 2,578-2,773 ft.

**Winkler County**

Keystone field: Magnolia 57 Walton, deepened from 2,996 ft. to 3,218 ft., new initial 35 bbl. daily, 1-in. choke, 300-qt. shot.
J. R. Sharp 2 Jenkins-Gulf, 210 bbl., ¾-in. choke, 300-qt. shot, 3,355-3,402 ft.
J. R. Sharp 1 Little-Jenkins, 290 bbl., ¾-in. choke, 240-qt. shot, 3,310-91 ft.

### SOUTHERN WEST TEXAS WILDCAT REPORT

**Crane County**

Gulf 1-F University, SE SE Sec. 22, Blk. 31, University Sur., drilling 9,492 ft.
Gulf 17 Waddell, Sec. 13, Blk. 3, H.&T.C. Sur., 4 mi. S of Sand Hills field, drilling 4,520 ft.
Eastham & Russell 1 McClintic, NE NE Sec. 210, Blk. F, C.C.S.D.&R.G.N.G. Sur., drilling 1,563 ft.

**Crockett County**

I. T. I. O. Roy Henderson, NW SE Sec. 33, Blk. ST, 2,000 ft., drilling 1,250 ft.
Geo. T. Morris 1 Brock Hoover, SW SE Sec. 99, Blk. 1, I.&G.N. Sur., 2,000-ft. test, drilling 655 ft.

**Culberson County**

Cecil Cothrun 1 Casey-Rounsoville, Sec. 7, Blk. 104, P.S.L. Sur., drilling 1,304 ft.

**Ector County**

Stanolind 1-B W. F. Cowden, SE W¼ Sec. 12, Blk. 44, Twp. 1n, T.&P. Sur., deep Holt lime test to 7,000 ft., top Clear Fork 5,190 ft., prep. core at 6,985 ft., T.D.
Cities Service 1 F. V. Addis, SW SE Sec. 34, Blk. 43, Twp. 2s, T.&P. Sur., T.D. 5,156 ft., hole 10° off vertical, prep. straighten hole.

**Loving County**

H. C. McAuley 1 E. Hall, SE Sec. 60, Blk. 7, W.&N.W. Sur., drilling 3,682 ft.
Sloan & Zook 1 T.&P. Trust, SW SE Sec. 37, Blk. 56, Twp. 1s, T.&P. Sur., 3¾ mi. NE of Tunstill gas well, 7-in. at 3,348 ft.
Pinal Dome Oil 1 Michigan Oil fee, NW SW Sec. 15, Blk. 26-C, P.S.L. Sur., 5,300-ft. test, drilling 30 ft.

**Pecos County**

Culbertson & Irwin 1 R. G. Heiner, NE NE Sec. 589, G.C.S.F. Sur., Ordovician wildcat, show oil in upper Ellenburger lime, show oil 5,382-90 ft. and 5,500-10 ft., T.D. 5,665 ft., P.B. 5,509 ft., testing.
Stanolind 1 Conry-Davis, SW SW SW Sec. 31, Blk. 9, H.&G.N. Sur., Ordovician test in Abell area, drilling 342 ft.

**Schleicher County**

Harold B. Opp 1 Jackson, Sec. 41, Blk. LL, T.C. Sur., T.D. 6,155 ft. (corrected), fishing tools.

**Reagan County**

H. Schooler 1 R. A. Wolters, NE NE Sec. 51, G.C.&S.F. Sur., S.D. for 8-in. casing 955 ft.

**Reeves County**

C. A. Kitsos 1 A. B. Burchard, SW Sec. 7, Blk. 58, P.S.L. Sur., Delaware test spudded and S.D., drilling water well last report.
Roy Johnson 1 Perkins, Sec. 18, Blk. 7-C, P.S.L. Sur., drilling 3,060 ft.
J. T. Pemberton 1 fee, NE NE Sec. 2, Blk. 55, Twp. 7, T.&P. Sur., first report, Delaware lime test, 7,500 ft., prepare to start.

**Sutton County**

S. B. Robert 1 George Allison, NW NE Sec. 44, Blk. K, G.H.&S.A. Sur., S.D., casing 740 ft.
Domain 1 G. S. Allison, SW NE Sec. 91, Blk. 9, T.W. N.G. Sur., Ellenburger lime test, S.D. 1,098 ft., last report.

**Terrell County**

Texas Consolidated Oil 1 Holmes, NE NE Sec. 14, Blk. 2-A, G.H.&S.A. Sur., 3,600-ft. test, 10-in. 1,100 ft., S.D.
H. H. Sides 1 Rose, Sec. 15, Blk. 148, T.&St.L. Sur., S.D. 625 ft.
E. M. Thomasson 3 Bates-Graham, 660 ft. from N and 2,490 ft. from W lines, Sec. 30, Blk. 1, I.&G.N. Sur., drilling 860 ft.

**Ward County**

Fitzpatrick & Slack 1 Wilson, Sec. 145, Blk. 34, H.& T.C. Sur., 1½ mi. SE of discovery well, T.D. 4,925 ft., S.D. for casing.
Gulf 6 Wristen, 1,997 ft. from SE and 1,989 ft. from NE lines, Sec. 18, Blk. 5, H.&T.C. Sur., deep Silurian test, drilling 3,310 ft.
Roeser & Pendleton, Inc., and Merry Bros. & Perini 1 Bird Hayes, 467 ft. from SE and SW lines, Sec. 164, Blk. 34, H.&T.C. Sur., ¼ mi. N of discovery gas well, top sat. in Delaware sand 5,089 ft., prep. core 5,259 ft.
J. E. Fitzpatrick 1 T. B. Pruit, SW SW Sec. 23, Blk. 1, W.&N.W. Sur., S.D.R. 140 ft.

**Winkler County**

Stanolind and Westbrook 1 Maracaibo, NW NW Sec. 19, Blk. 26, P.S.L. Sur., 2½ mi. NW Hendricks field, drilling 2,910 ft.

## NORTHERN WEST TEXAS

Stonewall County's prospective Ellenburger lime (Ordovician) discovery well offsetting a Simpson lime discovery of a year ago, has developed water in the lower formations and is preparing to plug back for completion attempts from the Mississippian lime level. The test is Shell Oil 1 Rutherford, Section 144, Block D, H.&T.C. Survey. A week ago saturation had been drilled in the Ellenburger lime from 6,195 to 6,239 ft. and casing cemented on top of the lime. Testing revealed water in the Ellenburger and preparations were under way to plug back. The original discovery well was Shell 1 Annie Smith, NW SW Section 143, Block 1, H.&T.C. Survey, completed for 581 bbl. daily from 6,065 ft. in the Mississippian lime early in August of 1940.

*North Cowden.*—Prospects of extending the North Cowden field 1½ miles north and into southern An-

# Now . . a SUPER Swivel

## FOR THE HIGHEST SPEEDS AND THE GREATEST DEPTHS

The ever-increasing loads and rotating speeds of the most advanced deep-drilling practice are well within the capacity of the "Oilwell" Super Swivel. Designed for the requirements of tomorrow, this truly super swivel provides an extra factor of safety for the most severe drilling of today.

*FEATURES:*

★ **Full 4" fluid-passage through gooseneck, wash pipe and body, resulting in streamlined flow—no change in fluid velocity. The body is provided with 7⅝" A.P.I. tool-joint threads (left-hand). Extra length permits rethreading.**

★ **Wash pipe faced inside and out with DI-HARD, having a hardness well above 600 Brinell and a very low coefficient of friction. DI-HARD greatly extends the service-life of the wash pipe and also its lubricated packing.**

★ **Two grease-lubricated oil seals, contacting a hardened-and-ground sleeve at the bottom of the housing, prevent leakage from the oilbath. Two similar lubricated seals close the oilbath at the top of the housing.**

★ **All bearings designed for capacities far exceeding the recommended maximum service-load of the swivel, operate in a 22-gallon circulating oilbath.**

★ **Swivel housing and elevator links protected from hammering and wear by an integral, rubber-padded bail rest. Rubber-padded ears prevent the links from sliding off.**

*Buy an "Oilwell" Super Swivel* today *and be ready for* tomorrow!

**"OILWELL" SUPER SWIVEL**

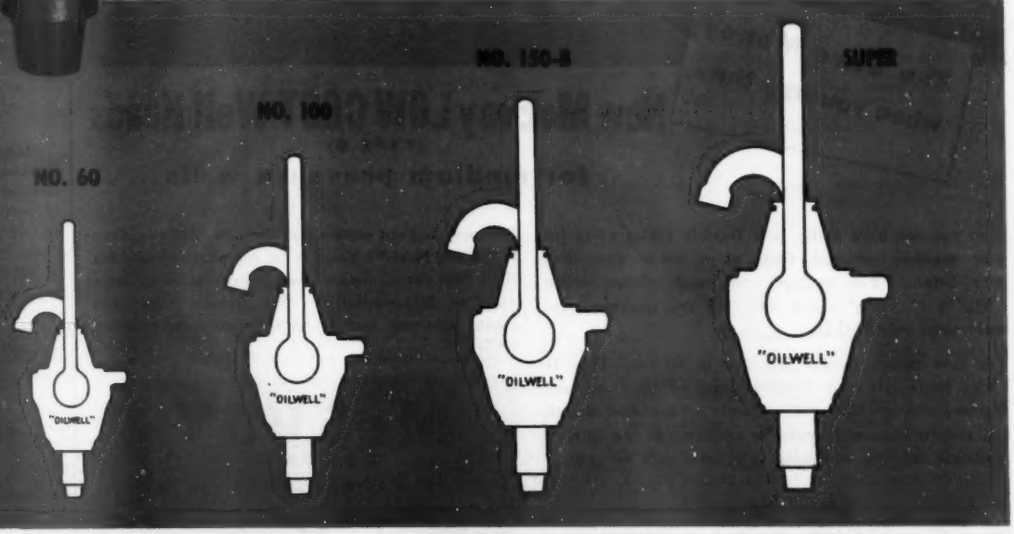
Maximum recommended drilling depths with 4½"—18 # drill pipe.

100 r.p.m.—17,000 feet
200 r.p.m.—14,000 feet
400 r.p.m.—11,000 feet
Dead-load capacity.....400 tons

**"OILWELL" SWIVELS ARE PREFERRED BY DRILLERS EVERYWHERE . . . AN EFFICIENT SIZE FOR EVERY NEED**

Maximum recommended drilling depths (feet) with 4½"—18 # drill pipe:

| | 100 r.p.m. | 400 r.p.m. |
|---|---|---|
| No. 50 | 5,700 | 3,800 |
| No. 100 | 8,500 | 5,600 |
| No. 150-B | 12,500 | 8,500 |
| SUPER | 17,000 | 11,000 |

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LOS ANGELES, CALIF.

drews County were seen at the Sun Oil 2-B O. B. Holt, 660 ft. from the south and 1,980 ft. from the west lines of Section 7, Block 43, Township 1n, T.&P. Survey. First shows of oil were found in lime at 4,130 ft. with several broken sections of oil-bearing lime being drilled and cored to 4,476 ft. A core from that depth to 4,482 ft., total depth, revealed bleeding core with pin-point porosity. The test was last reported fishing for cutters at 4,482 ft.

*Embar.*—Two tests in the Embar area of Andrews County were holding some attention at the close of the week as their outcome neared. Phillips 2 Embar, 1,980 ft. from the south and 660 ft. from the east lines of Section 5, Block 44, Township 2n, T.&P. Survey, found no shows of oil, gas or water in drilling to a total depth of 5,864 ft. It has been temporarily abandoned pending outcome of further development now under way on the large Embar ranch. Another test, Phillips 1 University-Andrews, in the same general area of Andrews County and located 660 ft. from the north and 1,980 ft. from the east lines of Section 32, Block 10, University Survey, is fishing for tubing preparatory to deepening from 5,741 ft. It was acidized at 5,510 ft. but showed only water on tests.

### NORTHERN WEST TEXAS COMPLETIONS

**Cochran County**

Slaughter field: Osage Drlg. Co. 2 Smith, 497 bbl., open tubing, 9,000 gal. acid, 5,030-76 ft.

**Gaines County**

Seminole field: Humble 2 Mathews, 720 bbl., ½-in. choke, 500 gal. acid, 5,102-5,330 ft.
Magnolia and Atlantic 6-217 H. & J., 508 bbl., ½-in. choke, 6,000 gal. acid, 5,198-5,309 ft.
Magnolia and Atlantic 11-251 H. & J., 885 bbl., ½-in. choke, 2,000 gal. acid, 5,206-80 ft.
Cedar Lake field: San Andres Prod. 1-A Johnson, dry at 5,000 ft., top anhydrite at 1,980 ft.

**Hockley County**

Slaughter field: San Andres Prod. 2-A Caddell, 269 bbl., 4.4 per cent water, 8,000 gal. acid, 4,870-4,995 ft.
San Andres Prod. 4-A Caddell, 277 bbl., 12 per cent water, 9,000 gal. acid, 4,890-5,005 ft.
Stanolind 10-A Slaughter, 1,253 bbl., 3-in. casing outlet, 10,000 gal. acid, 4,920-5,047 ft.
Tide Water 2 Lincoln, 788 bbl., open casing, 8,000 gal. acid, 4,920-5,003 ft.

**Howard County**

Wildcat: Cosden 1 fee, dry at 1,507 ft.

**Mitchell County**

Dockery & Robbins field: Staley 1 A. C. Mills, 267 bbl., 450-qt. shot, 1,650-1,745 ft.

**Yoakum County**

Wasson field: Argo Oil 8-A Comer, 1,429 bbl., open tubing, 4,000 gal. acid, 4,970-5,225 ft.
Continental 6-A Stevens, 1,148 bbl., open tubing, 12,000 gal. acid, 4,946-5,057 ft.
Denver Prod. & Refg. 24 Whittenburg, 922 bbl., open tubing, 10,000 gal. acid, 4,825-5,132 ft.
Humble 13 Bennett, 126 bbl., ¼-in. choke, 16,000 gal. acid, 5,150-5,276 ft.
Humble 15 Bennett, 378 bbl., ⅝-in. choke, 1,000 gal. acid, 5,150-5,275 ft.
Oil Development Co. 12-763 fee, 557 bbl., 1⅛-in. choke, 12,250 gal. acid, 5,030-5,270 ft.
Shell 11-B Baumgart, 1,325 bbl., open tubing, 10,000 gal. acid, 4,935-5,182 ft.
Shell 2 Dowden, deepened from 5,065 ft. to 5,158 ft., old initial 189 bbl., new initial 562 bbl., open tubing, 1,500 gal. acid.
Toddie L. Wynne 2 Willard, deepened from 5,009 ft. to 5,113 ft., old initial 409 bbl., new initial 1,609 bbl., 4,000 gal. acid.

### NORTHERN WEST TEXAS WILDCAT REPORT

**Andrews County**

Phillips 1 University-Drews, NW NE Sec. 32, Blk. 10, University Lands Sur., drilling 5,741 ft.
Phillips 2 Embar, NE SE Sec. 5, Blk. 44, Twp. 2n, T.&P. Sur., ¾ mi. N of Embar, S.D. 5,864 ft.
Furham Pet. 1 Lockhart-Brown, Sec. 24, Blk. 42-A, P.S.L. Sur., top solid lime 4,155 ft., T.D. 5,600 ft., P.B. 4,558 ft., treated 1,000 gal. acid, S.D.

**Cochran County**

Rhodes and Atlantic 1 Dean, C NE Tr. 4, Lge. 89, Lipscomb C.S.L., T.D. 5,150 ft., P.B. 5,112 ft., treated with 1,000 gal. acid, 210-qt. shot, P.B. to 5,099 ft., retreated 5,000 gal. acid, testing on pump, making 4 bbl. oil in 8 hr.
George Livermore 1 Wright, old well drilling deeper, old T.D. 4,997 ft., contracted to Ordovician, S.D. 5,741 ft.

**Gaines County**

Amon G. Carter 4-D Wasson, NW SE Sec. 50, Blk. AX, P.S.L. Sur., logged new pay about 6,610 ft., tight well, application filed to drill to 11,000 ft., S.D. 10,078 ft. (corrected).

**Hockley County**

Magnolia 1 M. Wilson, SW cor. Labor 8, Lge. 41, Maverick C.S.L. Sur., 1½ mi. N of production in slaughter field, derrick.

**King County**

J. B. Cunningham 1 F. W. Thormann, NE NE W. C. Browder Sur., drilling 1,680 ft., 3,000-ft. test, last report.

**Lubbock County**

A. L. Henderson 1 W. D. McMillan, SE NW Sec. 4, Blk. 2-D, H.E.&W.T. Sur., location.

**Martin County**

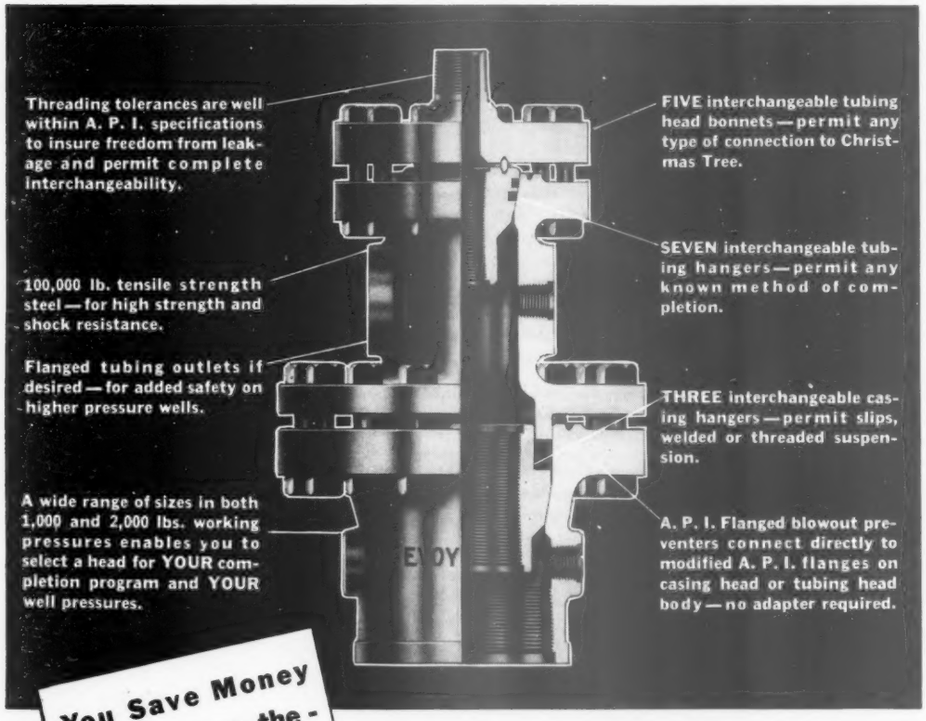
Magnolia 1 N. D. Teague, NW NW Lab. 10, Lge. 260, Borden C.S.L. Sur., 5,500-ft. test, waiting on cement 240 ft.

**Mitchell County**

Peck & Croft 1 Jack Smith, 2,173 ft. from N and W lines, Sec. 19, Blk. 26, T.&P. Sur., drilling 2,390 ft.
C. E. Casebolt 1 J. E. Franklin, NE NE NW Sec. 50, Blk. 27, T.&P. Sur., S.D. repairs 55 ft.

**Yoakum County**

George Livermore 1 Ownby, NE NE NE Sec. 502, Blk. D, Gibson Sur., drilled broken saturation 5,237-85 ft., flowed several heads oil, treated 3,500 gal. acid, flowed 21 bbl. in 3 hr., prep. retreat 6,000 gal., P.B. 5,281 ft. from 5,294 ft., shut in.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A wide range of sizes in both 1,000 and 2,000 lbs. working pressures enables you to select a head for YOUR completion program and YOUR well pressures.
FIVE interchangeable tubing head bonnets—permit any type of connection to Christmas Tree.
SEVEN interchangeable tubing hangers—permit any known method of completion.
THREE interchangeable casing hangers—permit slips, welded or threaded suspension.
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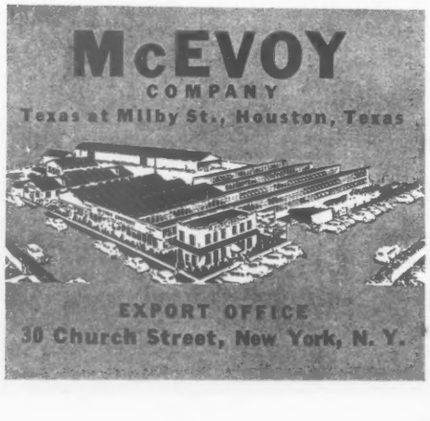
Why not find out more about the new McEvoy Type D "Casing Nests"? You can get complete information from McEvoy Company, your supply store or your McEvoy Representative. We believe they will make important savings on your medium pressure wells.





## TEXAS PANHANDLE

AMARILLO, Tex., Feb. 24.—New completions marked one of the most profitable weeks in several months for the large Panhandle field, with a total of 17 completions recorded. Of this number, 15 were for oil with an aggregate initial of 5,036 bbl., and two large gas wells were completed for a combined initial of 407,000,000 cu. ft. daily. One of the largest wells completed in the field in some time was finaled by the Huber Petroleum Co. on its Weatherly lease in Section 25, Block Y, A.B. Survey, Hutchinson County. It made 2,658 bbl. daily on gas-lift from the granite-wash pay from 2,989 to 3,037 ft.

### TEXAS PANHANDLE COMPLETIONS

(24-hr. pumping gages)

**Carson County**

Clayton & Dwyer 6 Schaffer, 46 bbl., 3,065-93 ft., 142-qt. shot.
Magnolia 97 fee (244), 211 bbl., 3,040-3,156 ft., 40-qt. shot.
Skelly Oil 113 Schaffer, 158 bbl., 3,067-3,104 ft., 197-qt. shot.

**Gray County**

Magnolia 41 fee ((277), 117 bbl., 2,925-94 ft., 340-qt. shot.
Moran Drlg. Co. 6 Skidmore, 99 bbl., 3,135-3,294 ft., 720-qt. shot.
Phillips 4 Benton, 164 bbl., 3,077-3,178 ft., 370-qt. shot.
S. & M. Oil 10 Worley, 44 bbl., 3,075-3,208 ft., 420-qt. shot.

**Hutchinson County**

Benonine Oil 8 Starnes, 125 bbl., 3,105-3,200 ft., 720-qt. shot.
Midstates Oil 33 Whittenburg, 422 bbl., 2,805-70 ft., 550-qt. shot.

*(Continued on Page 109)*

By
ROBERT INGRAM

# Play Swings to Logan County Where New Find Is Expected

LOGAN COUNTY was holding the spotlight this week by virtue of important new wildcats being started as well as for the testing under way at Sunray et al 1 Donoghue (formerly Hamilton & Fain 1 Donoghue), NW SE 7-17-1w, which showed for the first major strike of the year in Oklahoma.

Rain and snow made roads to the 1 Donoghue so muddy that operators were held up several days trying to get tools on location to drill the plug and begin testing.

Meantime, royalty trading slacked off after the first rush to buy available acreage. The well, drilled by Fain Drilling Co. and a group of Tulsa operators, had saturation in the Bartlesville, Misener and first and second Wilcox sand zones. Total depth is 5,445 ft. with pipe set on top of the second Wilcox at 5,420 ft.

After finding the upper formation checking thin, a fair royalty play started, and, a week ago, when the second sand was penetrated, the trading opened up and considerable royalty was taken at prices ranging from $100 an acre upward. Before the deeper zone was reached, Continental Oil Co., bought the quarter interest in the well and 560 acres of leases held by E. W. Hamilton and S. E. Cullinan of Tulsa.

Meantime, south of the Langston pool, Carter Oil Co. was starting big hole at 1 Gaffney, E½ SE NW 12-16-1w, a Wilcox sand test located on a seismograph block of leases with a number of major companies holding protective acreage.

In western Logan County, on the Lovell trend, Kerlyn Oil was starting 1 Wareing, SW NE SW 33-19-4w, north of the Lovell townsite. This is to be a 5,000-ft. test.

Play for the Layton zone on the south flank of the Lovell pool fell off during the week, although Danciger Oil & Refineries, Inc., was ready to test 1 Knecht, SE SE SE 21-18-4w. This well, which has been shut down for 2 months, apparently missed the pay in the Layton and went to the second Wilcox sand at 6,240-45 ft.

Other wildcat areas in the state were relatively quiet, due both to the season of the year and to continued bad weather. However, Kerlyn was starting another test in Pottawatomie County, the 1 Johnson, NE SE SE 23-6-4, near the Sacred Heart pool, on a block of about 800 acres. Contract is for 3,000 ft.

Mayes Oil Co., 1 Sowards, SW SW SW 15-15-6, north of Stroud in Lincoln County, appeared to be a pool opener at a total depth of 4,070 ft., although early testing indicated it would be small. The pay zone was acidized after a show of oil and gas was found, and operators have been bailing from 19 to 20 bbl. a day with about 1½ bbl. of water which is believed coming from up in the hole. The well was drilled to 3,737 ft. last summer and was shut down until December when arrangements were made to deepen it for a test.

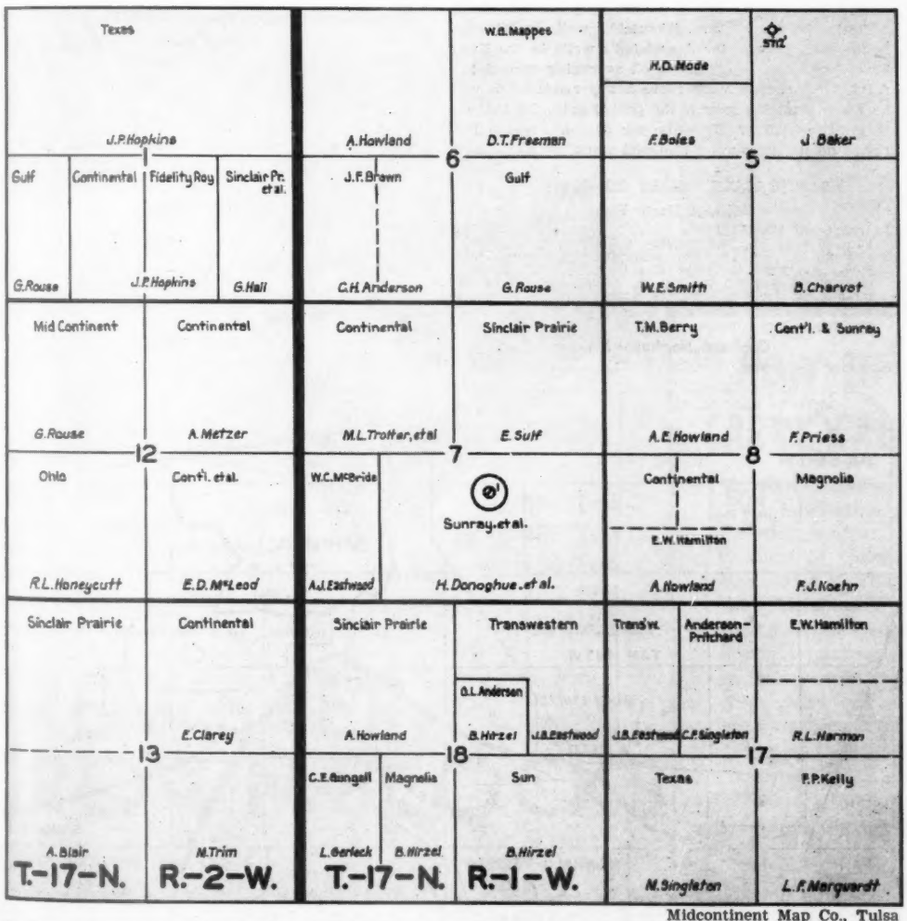
*Empire pool.*—Revival of activity in the old Empire area of Stephens County was seen in deepening to new, deeper-pay zones. New production was found last year by George Pace in two wells at 2,200 to 2,300 ft. Last week Cities Service moved in tools to deepen 33 Surber, NE SW SW 33-1s-8w. Present depth is around 1,900 ft., close to the average depth for the field, and the hole will be drilled to around 3,600 ft.

*Hobart pool.*—The Hobart pool of Kiowa County was defined on the southwest edge by Phillips Petroleum Co. 4 Warner, SW NE SE 19-7-17w, which was dry at a total depth of 1,330 ft. Pontotoc lime was topped at 1,248 ft. Phillips also started work this week at 5 Warner, NE SE SE 19-7-17w, a south offset to 3 Warner, and Gled Oil et al 3 Watkins, SW NW NW 20-7-17w, which blew out and went wild several times, was shut down at 960 ft.

## SUMMARY OF COMPLETIONS

| | No. | Prod. | Footage |
|---|---|---|---|
| Oil wells: St. Louis | 2 | 568 | 7,949 |
| Other fields | 12 | 2,540 | 24,982 |
| Wildcats | 1 | 172 | 4,330 |
| Gas wells: Laffoon | 4 | *61.5 | 16,401 |
| Cement | 1 | *52 | 5,485 |
| Dry holes: Fields | 5 | ..... | 13,488 |
| Wildcats | 8 | ..... | 21,572 |
| Total | 33 | ..... | 94,207 |
| Recompletion | 2 | 24 | ..... |

*Million cu. ft.




Midcontinent Map Co., Tulsa

***Testing of Sunray et al 1 Donoghue, NW SE 7-17-1w, northwest of the Langston pool in Logan County, Oklahoma, held attention of the industry this week as it bid fair to be the first major strike in the state for 1941. Bad roads delayed operators for several days after they set pipe at 5,420 ft. on the second Wilcox sand. The well is circled on the map***

## OKLAHOMA COMPLETIONS

### Caddo County

Cement pool: Miller 5 Garner, SE SW 26-6-10w, 52,000,000 cu. ft. gas, T.D. 5,485 ft., casing 5,472 ft., perf. 4,817-5,380 ft.

### Carter County

Ed Cox pool: Elliott 4 Pierce, NW SE NE 22-2s-2w, pumped and flowed 17 bbl., T.D. 882 ft., casing 740 ft.

Healdton pool: Jones 1-A Ford, SE NW 13-4s-3w, temporarily abandoned, T.D. 3,675 ft., casing 1,340 ft., Simpson 2,986 ft., Simpson green shale 3,152 ft., cored limestone and shale 3,330-36 ft., dip 45-50°.

Wildcat: Wirt Franklin 1 Rittenhouse, SE NE SE 5-4s-2w, dry, T.D. 3,009 ft.

### Grady County

Knox pool: McCasland 2 Ball, NW SE SE 21-3-5w, pumped 20 bbl., sand 1,756-69 ft., T.D., casing 1,756 ft.

Wildcat: Palmer 1 Ramsey, SE NE 31-5-8w, dry, T.D. 6,426 ft.

### Hughes County

Wildcat: Mid-Continent 1 Davis, SE NW 15-6-8, dry, T.D. 3,390 ft., Cromwell 3,365 ft., cored 3,366-77 ft. and 3,377-90 ft., no show.

### Jackson County

Altus pool: Fox 3 Mary, SE SW SW 2-1-20w, pumped 40 bbl., casing 1,388 ft., T.D. 1,631 ft.

P. H. Phillips 1 Baker, SE NE NE 8-1-20w, temporarily abandoned, T.D. 1,750 ft., casing 1,615 ft.

Burnham 9 Hensley, SW NW NW 10-1-20w, pumped 21 bbl., casing 1,307 ft., T.D. 1,438 ft.

Altus 3 Maud, SE SW NE 15-1-20w, old well drilled deeper from 1,562 ft. to 1,629 ft., pumped 6 bbl.

Wildcat: Burke 1 Estes, SW NE 34-3-19w, dry, T.D. 1,125 ft., granite 1,065 ft., granite wash 985-87 ft., odor.

### Jefferson County

Wildcat: Johnson 1 Bounds, NW SW SW 13-6s-6w, dry, T.D. 2,004 ft., casing 1,845 ft., sand 1,847-62 ft., est. 10 bbl. oil and 150 bbl. water.

### Johnston County

Wildcat: Wolff 1 Laughlin, SE NW SW 16-4s-8e, dry, granite 212-16 ft., T.D.

### Kay County

Wildcat: Williams 1-A Trueblood, SE SE 25-25-1w, dry, T.D. 2,424 ft., sandy limestone 2,400-17 ft., show oil and water, lost hole.

### Kiowa County

Hobart pool: Phillips 3 Warner, SE NE SE 19-7-17w, potential 1,322 bbl., now pumping 20 bbl. an hr.

*(Continued on Page 122)*

# Several Wildcats Started as Exploratory Play Increases

By
L. P. STOCKMAN

LOS ANGELES, Calif., Feb. 24.—As has been expected, wildcat exploration has shown a substantial increase since the beginning of the current year and several additional exploratory wells are scheduled to get under way at an early date. Included in this projected work is a wildcat to be drilled by Union Oil Co. southeast of the Greeley field in Kern County, another to be drilled by Continental Oil Co. a few miles northwest of the North Belridge field, and a test to be drilled by Tide Water Associated Oil Co. northeast of Santa Ana in Orange County. Union's new wildcat will be drilled in 3-30s-26e, southwest of three dry holes drilled by Superior Oil Co. in the same section. This area has particular merit because 9 Kern County Land of Superior Oil Co., the first test drilled in the area, showed commercial production for a few days before going to water. Superior subsequently drilled 10 Kern County Land a few hundred feet southwest of 9 Kern County Land and later drilled 12 Kern County Land southwest of 9 Kern County Land and east of 10 Kern County Land. All three wildcats were ultimately abandoned as unproductive and the area has been inactive since that time. Union's new wildcat will have the Rio Bravo or Vedder zones of Miocene age as its objective and may require at least 12,000 ft. of hole before drilling is concluded.

## SUMMARY OF COMPLETIONS

| | No. | Bbl. | Footage |
|---|---|---|---|
| Oil wells: San Joaquin Valley | 8 | 7,651 | 68,945 |
| Coastal district | 2 | 1,472 | 14,558 |
| Los Angeles Basin | 2 | 1,480 | 8,467 |
| Total | 12 | 10,603 | 91,970 |
| Dry holes: San Joaquin Valley | 1 | ..... | 3,240 |
| Los Angeles Basin | 1 | ..... | 5,288 |
| Total | 2 | ..... | 8,528 |

*Paloma.*—Operators in the Paloma field of Kern County are completing plans whereby all production activities in the field will be discontinued or seriously reduced pending completion of the plan to unitize this distillate field. After completing preliminary plans, it will require several months to erect the necessary facilities. Thus it may be late this year before limited production is started.

*North Belridge.*—Continental's projected wildcat northwest of the North Belridge field in Kern County will be drilled on the Mabury ranch although no actual location has yet been decided on. The company has leases on about 2,000 acres northwest of Belridge between Shale Hills and Blackwells Corner. Tide Water Associated's new wildcat play is in the Santa Ana area where the company leased up about 1,500 acres a month or so ago. The company is paying $5 a month per acre for rental and paid $25 an acre to cover rental to July 1. General Petroleum Corp. drilled a dry hole southwest of Santa Ana a year or so ago on the Was property but failed to find any encouragement and subsequently pulled out of the area. In addition to the above work, Barnsdall Oil Co. has started a wildcat on the jail farm property in the Newhall-Castaic region of Los Angeles County, and Bankline Oil Co. has already started a wildcat in the Maricopa section south of the Midway-Sunset field in Kern County. Tide Water Associated Oil Co. has had location staked for a wildcat to be drilled east of the Strand field in the San Joaquin Valley for several months but no actual work has yet been started. The company is apparently waiting on the outcome of a deep test being drilled by it within the present productive limits of the Strand field. Shell Oil Co., Inc., recently secured several thousand acres in the Delano-Famosa area but will not make location until seismograph work has been finished. While the search goes on for new fields in the San Joaquin Valley, the Newhall-Castaic region gets hotter. Several new wildcats are scheduled to be drilled in the Castaic area in the immediate future. This district is leased almost solid but operators are waiting until the rainy season is over before starting wildcat work.

### Resuming Production

With the demand for heavy unrefinable crude oil increasing by leaps and bounds due to reduction of available stocks, operators are making preparations to resume production in fields yielding heavy oil. Recently Tide Water Associated resumed production in 15 wells in the Kern River field that had been shut in for several years and present plans call for the opening up of additional wells that this company has shut in at Kern River. Tide Water Associated has about 150 wells in the Kern River field that have been shut in for several years as a conservation measure and for economic reasons. It is the present intention to open up about 200 of these wells but it will be another several weeks before they will meet the present demand. The Kern River field is a water-drive field and consequently operators find it necessary to produce large quantities of water in order to secure oil production. All wells in this field are small producers and the average is probably 3 bbl. of crude oil and 100 bbl. of water daily. The water content varies in the field and since these wells have been shut in for several years it may take some weeks to reduce the water head and permit normal production. Richfield Oil Corp. recently resumed production in 40 wells that it has shut in at Midway-Sunset and will probably open up additional wells in the near future. Richfield's wells at Midway-Sunset and Tide Water Associated's wells in the Kern River produce a heavy crude oil averaging around 14° A.P.I. If marketers want more heavy crude oil it will be made available soon if the posted price for this oil is increased 10 or 15 cents per barrel. Present low prices do not encourage remedial work.

### SAN JOAQUIN VALLEY COMPLETIONS

**Belridge North Field**

Belridge Oil Co. 9-1 fee.....1-28s-20e
Flowed 401 bbl., 30.6 gravity, 2.7 per cent cut, 8,845,000 cu. ft. gas. 16/64-in. and 20/64-in. beans. Pressures 960/1,290 lb. Elev. 634 ft. T.D. 8,387 ft. 9-in. water string 7,985 ft. 438 ft. 4¾-in. liner 8,387 ft. Perf. 7,947-8,387 ft. 8,342 ft. 2½-in. tubing. Completed in Wagonwheel zone of Eocene age. 50 days' drilling time. Top Temblor 5,112 ft. Kern County.

**Coalinga Northeast Field**

Superior 6 Husong.....18-19s-16e
Flowed 1,210 bbl., 25.7 gravity, 0.3 per cent cut, 650,000 cu. ft. gas. 32/64-in. bean. Pressures 850/3,000 lb. Elev. 584 ft. T.D. 8,197 ft. 7⅝-in. water string 8,022 ft. 104 ft. 5½-in. liner 8,197 ft. 84 ft. 5½-in. liner 8,093 ft. 120-mesh perf. 8,157-97 ft., 8,030-93 ft. 8,137 ft. 2½-in. tubing with packer 8,100 ft. and bottom-hole valve 8,091 ft. 37 days' drilling time. Kreyenhagen 6,748 ft., green sand 7,804 ft., Gatchell oil sand 8,022 ft. Bottomed in Gatchell oil sand. Fresno County.

**Coalinga Southeast Field**

Standard 2-19-F fee.....19-20s-16e
Flowed 1,968 bbl., 29.1 gravity, 0.5 per cent cut, 1,320,000 cu. ft. gas. 30/64-in. bean. Pressures 950/1,200 lb. Elev. 740 ft. T.D. 7,810 ft. 7-in. water string 7,675 ft. 158 ft. 5¾-in. liner 7,807 ft. Perf. 7,681-7,807 ft. 7,768 ft. 2½-in. tubing. Completed in productive Gatchell zone of Eocene age. Kreyenhagen 6,316 ft., green sand 7,622 ft., Gatchell 7,677 ft. Bottomed in Gatchell oil sand. 51 days' drilling time. Fresno County.

**Kern River Field**

McDonald & Dearin 7 Front.....11-28s-27e
Pumped 140 bbl., 14.1 gravity, 3 per cent cut. Elev. 928 ft. T.D. 1,831 ft. 10¾-in. water string 1,630 ft. 246 ft. 8⅝-in. liner 1,830 ft. 187-mesh perf. 1,640-1,830 ft. 1,402 ft. 3-in. tubing. Completed in Tegeler sand in Kern River series of Pliocene age. 68 days' drilling time. Top of oil sand 1,634 ft. Bottomed in oil sand. Kern County.

**Kettleman North Dome Field**

Standard 76-19-J fee.....19-21s-18e
Flowed 525 bbl., 38.1 gravity, 5 per cent cut, 11,600,000 cu. ft. gas. 56/64-in. bean. Pressures 725/1,500 lb. Elev. 789 ft. T.D. 11,100 ft. 6⅝-in. water string 10,415 ft. 740 ft. 4¾-in. liner landed 11,100 ft. Perf. 10,443-10,683 ft., 10,896-11,053 ft. 10,821 ft. 2½-in. tubing with packer. Hole cleaned out to 11,093 ft. prior to completion. Kreyenhagen 9,405 ft., McAdams sand of Eocene age 10,425 ft. Kern County.

**Paloma Field**

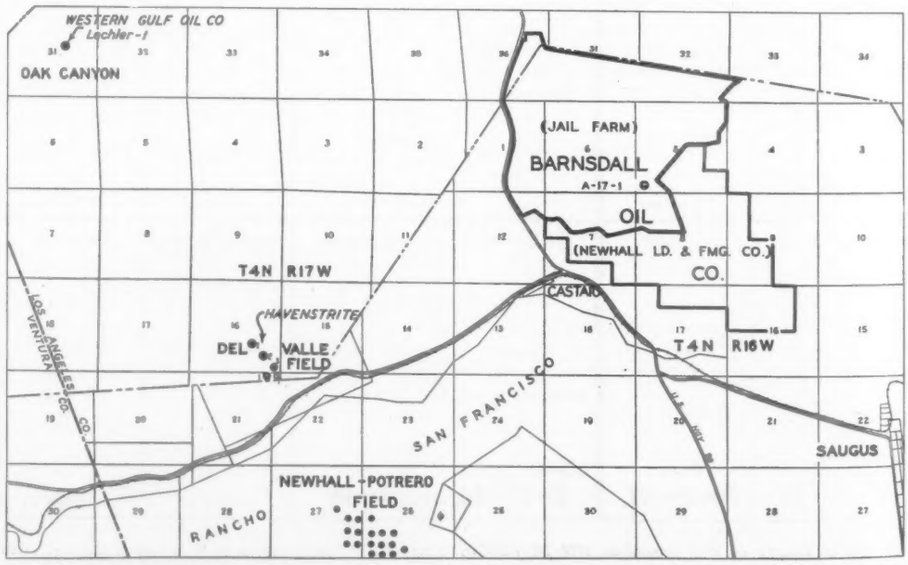
Ohio Oil Co. 83-4 Kern County Land.....4-32s-26e
Flowed 1,220 bbl., 52 gravity, 2 per cent cut, 8,300,000 cu. ft. gas. 48/64-in. bean. Pressures 2,500/3,000 lb. Elev. 303 ft. T.D. 10,340 ft. 7-in. water string 9,990 ft. 367 ft. 4¾-in. liner 10,320 ft. Perf. 10,004-10,320 ft. 10,274 ft. 2½-in. tubing including 220 ft. of 2-in. on bottom. Schlumberger N point 9,912 ft. Top oil sand 10,001 ft. Bottomed in shale. Completed in Stevens oil sand in which hydrocarbons are in vapor phase. 68 days' drilling time. Kern County.

**Rio Bravo Field**

Union 6-34 Kern County Land.....34-28s-25e
Flowed 1,270 bbl., 39.9 gravity, 0.5 per cent cut, 1,100,000 cu. ft. gas. 38/64-in. bean. Pressures 1,200/1,250 lb. Elev. 333 ft. T.D. 11,475 ft. 7-in. water string 11,419 ft. 102 ft. 5-in. liner landed 11,474 ft. Completed in Rio Bravo zone. 37½ days' drilling time. Top productive Rio Bravo oil sand 11,439 ft. Bottomed in oil sand. Kern County.

**Ten Section Field**

Shell 56-29-A Kern County Land..... 29-30s-26e




*Northwest of the Newhall-Potrero and Del Valle fields and southeast of the Oak Canyon field in Los Angeles County, Barnsdall has started a wildcat on the recently acquired jail-farm property leased from Los Angeles County on the basis of a 25-per-cent royalty and a cash bonus of $50,000*

Flowed 2,356 bbl., 34.1 gravity, 0.5 per cent cut, 2,540,000 cu. ft. gas. 48/64-in. bean. Pressures 375/1,100 lb. Elev. 332 ft. T.D. 8,235 ft. 4½-in. combination string 8,230 ft. Perf. 7,975-8,230 ft. 7,951 ft. 2-in. tubing. Schlumberger N point 7,455 ft. Top upper Stevens oil sand 7,793 ft. Completed in Stevens zone and bottomed in oil sand. 23 days' drilling time. Kern County.

**Tupman Field**

Richfield 14-29-A Kern County Land .....29-30s-25e
Flowed 529 bbl., 35.2 gravity, 0.8 per cent cut, 1,000,000 cu. ft. gas. Two 1½-in. beans. Pressures 250/1,100 lb. Elev. 308 ft. T.D. 9,380 ft. 7-in. water string 8,800 ft. 609 ft. 5¾-in. liner 9,375 ft. Perf. 8,888-9,002 ft., 9,030-9,262 ft., 9,290-9,373 ft. 9,290 ft. 2½-in. tubing. Schlumberger N point 8,367 ft. Top Stevens oil sand 8,592 ft. Completed in upper and lower Stevens oil zone. 105 days' drilling time. Kern County.

## SAN JOAQUIN VALLEY OUTPOSTS

**Coalinga Southeast Field**

Standard 48-31-B fee .....31-19s-16e
Preparing to spud. Fresno County.

**Coles Levee Field**

Standard 20-8 Kern County Land 5-31s-25e
T.D. 9,490 ft. in Stevens oil sand and shale. Pulling liner to deepen. Top oil sand 8,890 ft. Landed 9,446 ft. 2½-in. tubing. Elev. 430 ft. Kern County.
Standard 20-9 Kern County Land ..... 9-31s-25e
Rigged up. Elev. 304 ft. Kern County.

**Elk Hills Field**

Standard 42-31-S ..... 31-30s-24e
Drilling 6,020 ft., ahead in sand and shale. Elev. 1,122 ft. Kern County.
Standard 44-29-S .....29-30s-24e
Drilling 3,794 ft. Kern County.

**Kettleman North Dome Field**

Standard 1-1-U fee ..... 1-23s-16e
Drilling 11,220 ft. ahead in shale. Flowed 4,000 bbl. salt water from 10,968 ft. Shot four ½-in. holes 10,840-42 ft. Bottomed in Eocene. Kings County.

**Midway-Sunset Field**

Bankline Oil Co. 24-24 Sunset ..... 24-11n-23e
T.D. 785 ft., drilling in surface sand. Located southeast of present limits of production. Elev. 970 ft. Kern County.
North American Oil Consd. 1-28 W.P. .....28-32s-23e
Drilling 5,610 ft. in very hard shale with streaks of impervious sand. Kern County.

**Paloma Field**

Western Gulf 12-12-B Kern County Land .. 12-32s-26e
Drilling 10,665 ft. in Stevens oil sand. Formation test 10,435 ft. flowed 572 bbl., 52.7 gravity, clean. Bottom-hole pressure 2,750 lb. Kern County.

**Strand Field**

Associated 25-7-E Kern County Land ..... 7-30s-26e
Drilling at 12,275 ft. in hard shale. Kern County.

## SAN JOAQUIN VALLEY WILDCATS

**Cantua Creek District**

Texas 27-13 Southern Pacific..... 13-17s-15e
Drilling 8,592 ft. in sand and shale. Fresno County.

**Buena Vista Hills District**

Honolulu 25-P fee .....10-32s-24e
Drilling 12,300 ft. in shale. Kern County.

**Buttonwillow District**

Texas 47-15 Southern Pacific.....15-29s-24e
T.D. 7,956 ft. in sand and shale. Cemented fish in place 6,178-6,536 ft. Kern County.

**Pyramid Hills District**

C. C. M. O. Co. 1 Bocqueraz.....17-24s-18e
T.D. 1,246 ft. in sandy shale. Suspended account bad roads. Point of Rocks oil sand 765-825 ft. Elev. 718 ft. Kings County.

**Tejon District**

Richfield 1 Tejon ranch.....2-10s-19e
Drilling 10,351 ft. in gray Eocene sand and shale. Kern County.
Kern Line Oil Co. 1 Wheeler Ridge .....19-11n-19w
T.D. 8,291 ft. Formation test open 15 min., no blow, recovered 650 ft. mud and water, 1,200 ft. gassy salt water testing 1,150 grains per gallon. Shooting with nitro at 8,236 ft. Will swab again. Kern County.

**Shafter District**

Continental 2-C Kern County Land .....35-27s-24e
Drilling 6,997 ft. in sandy shale. Kern County.

## Dominguez

Union Oil Co. has concluded drilling operations on 79 Callender, a deep test in the Dominguez field of Los Angeles Basin at 12,720 ft. and has plugged back to 10,314 ft. Preparations are under way to land a string of casing for a test of an oil sand found below the eighth Callender zone which at present is the deepest producing zone in the field. Drilling operations were concluded in the basement and thus the number of zones in this field is known. The new zone found below the eighth Callender appears rather tight and it remains to be seen whether it has enough porosity and permeability to produce commercially. If this new zone fails to result in production, the company will plug back to the eighth Callender and produce that zone. The outcome of work on this well is of prime importance because if a new zone is found it will lead to additional drilling in the area west of present production. Union Oil Co., in addition to finishing drilling on 79 Callender, has staked location for 8 Austin in the west end of the Austin lease north of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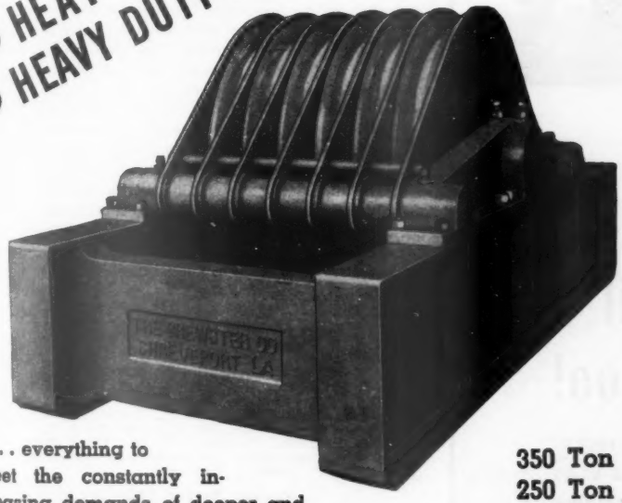

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### Long Beach

Union Oil Co. has finished drilling operation on 19 Long Beach Community in the Long Beach field and the well has been passed for production. The well failed to result in a natural flow and pumping equipment has been rigged up. It should be good for about 250 bbl. if it matches the production of other deep-zone wells located in close proximity. The formation opened up has proved to be very tight and thus production can not prove to be large. This well is bottomed in the deep Dormax zone found a few years ago but which to date has failed to yield large production. Bottom of the hole is 10,894 ft. but it has been plugged back to 10,482 ft. A string of 7-in. casing was cemented at 9,657 ft. and 9,577 ft. of 3-in. tubing was run early this week. Swabbing operations have resulted in a recovery of 340 bbl. of oil and water but the well has failed to show any indication of flowing. This is the deepest well drilled in the Long Beach field to date and is bottomed in upper Miocene. Out in the Flood Control section of the Long Beach where an accumulation was found several years ago by Hilldon Oil Co. along a separate fault, Union Oil Co. is making preparations to redrill and deepen 4 Oil Operators down to the Miocene. This well, which has been producing for several years, is located on property owned by the field's waste-water-disposal system.

### LOS ANGELES BASIN COMPLETIONS

#### Huntington Beach Field

Southwest Expl. Co. 35 State ..... 3-6s-11w
Pumped 1,260 bbl., 25.6-gravity, 0.1 per cent cut. Elev. 49 ft. T.D. 4,761 ft. 8⅝-in. water string 4,000 ft. 788 ft. 6⅝-in. liner 4,761 ft. 80-mesh perf. 3,998-4,761 ft. 4,488 ft. 2½-in. tubing. 29 days drilling time. Bottomed beneath Pacific Ocean in state tidelands by directional drilling. Orange County.

#### Wilmington Field

Bolling Oil Co. 4 Harbor ..... 32-4s-13w
Flowed 220 bbl., 15.1-gravity, 5 per cent cut, 18/64-in. bean. Pressures 175/200 lb. Elevation 21 ft. T.D. 3,706 ft. 8⅝-in. water string 3,010 ft. 740 ft. 6⅝-in. liner 3,706 ft. 80-mesh perf. 3,120-3,706 ft. 3,685 ft. 2½-in. tubing with packer. 18 days drilling time. Completed in Ranger zone. Los Angeles County.


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### LOS ANGELES BASIN OUTPOSTS OR DEEP TESTS

#### Dominguez Field

Union 79 Callender ..... 32-3s-13w
T.D. 12,720 ft. P.B. 10,314 ft. Will set casing. 16-in. surface pipe 954 ft. 8⅝-in. casing 7,005 ft. as protection string. Los Angeles County.

#### Inglewood Field

Standard 3-1 L.A.I. ..... 17-2s-14w
T.D. 9,160 ft. Drilling and coring hard Miocene sandy shale with streaks of tight oil sand. Los Angeles County.
R. R. Bush Oil Co. 1 Smith ..... 8-2s-14w
T.D. 7,996 ft. Landed 7-in. casing 7,920 ft. for test of showings. Los Angeles County.
R. R. Bush Oil Co. 1 Merchants ..... 8-2s-14w
Derrick. Los Angeles County.

#### Long Beach Field

Union 19 L.B.C. ..... 30-4s-12w
T.D. 10,894 ft., P.B. 10,582 ft. with 70 sacks cement. Swabbed oil and water. Rig to pump. 969 ft. 5½-in. liner. 9,577 ft. 3-in. tubing. Los Angeles County.

#### Rosecrans Field

Southern Cal. Pet. Corp. 1 Townsite .... 12-3s-14w
Drilling 3,486 ft. in sand and shale. Cemented 11¾-in. surface pipe 1,001 ft. Los Angeles County.

## COASTAL DISTRICT

Texas Co. is the newest entrant into the Castaic region of western Los Angeles County and the company has made a tentative location for a wildcat to be drilled in the southeast corner of 14-3n-16w. This location is in a block of leases about 3,000 ft. from 1 Edwina of British American Production Co. which was recently abandoned. Recent developments in the Castaic area indicate that many wells drilled in that area in the past were not carried deep enough and unless the Modelo is penetrated for at least 1,000 ft. these abandonments do not constitute conclusive tests. Western Gulf Oil Co. is making a conclusive pumping test on 1 Lechler, the discovery well in the Oak Canyon field, but plans are under consideration for the drilling of a deep test. This well is still showing a cut of about 18 per cent and will not show any improvement unless remedial work is undertaken.

A number of drilling wells were rained out for the greater part of the current week and it will probably be another 10 days before roads are dry enough to permit the hauling of equipment. Even in cases where no additional equipment is necessary it is impossible in many cases to reach wells due to washed out roads. Barnsdall Oil Co. has made location for 88-11 State to be drilled in the Elwood field of Santa Barbara County in the immediate future. No wells have been drilled in this field in several years and the new location is one that was not drilled at the time this field was originally developed. Earlier this year it had been anticipated that Ventura County as well as Santa Barbara and San Luis Obispo counties would receive considerable attention from a wildcat standpoint but now that operators are seeking heavy crude-oil production operations will probably be centered in other sections of the state. It is logical to assume, however, that Union Oil Co. will do considerable drilling in the Santa Maria Valley field of Santa Barbara County later this year.

### COASTAL DISTRICT COMPLETIONS

#### Gato Ridge Field

Petrol Corp. 3-13 Tognazzini ..... 15-8n-32w
Pumped 100 bbl., 14.9-gravity, 20 per cent cut. Elev. 1,287 ft. T.D. 4,696 ft. 8⅝-in. water string 1,850 ft. 1,063 ft. 6⅝-in. liner 2,880 ft. 1,850 ft. 5-in. liner 4,658 ft. Perf. 2,485-2,880 ft., 2,990-4,658 ft. 4,200 ft. 2½-in. tubing. Pumped all water for 4 days. Oil production gradually increased. 60 days drilling time. Santa Barbara County.

#### Ventura Avenue Field

Shell 129 Taylor ..... 21-3n-23w
Flowed 1,372 bbl., 30.9-gravity, 3 per cent cut, 938,000 cu. ft. gas. 58/64-in. bean. Pressures 110/1,150 lb. Elev. 546 ft. T.D. 9,862 ft. 7⅝-in. water string 9,340 ft. 1,554 ft. 5½-in. liner 9,859 ft. Perf. at intervals 8,347-9,859 ft. 8,990 ft. 2½-in. tubing. Top oil sand 8,360 ft. Bottomed in oil sand. Ventura County.

### COASTAL DISTRICT WILDCATS

#### Castaic District

Barnsdall 1-17-A Honor Rancho ..... 5-4n-16w
Grading road and location. Rained out. Los Angeles County.

#### Del Valle District

R. E. Havenstrite 1 Vasquez ..... 21-4n-17w
Drilling 2,996 ft. in sandy shale. 13⅜-in. surface pipe 372 ft. Los Angeles County.
Universal Consd. Oil Co. 1 Dennis ..... 21-4n-17w
Derrick. Los Angeles County.

#### Huasna District

Harvely Oil Corp. 2 Huasna ..... 11-32s-14e
Drilling 1,584 ft. in surface sand and shale. Elev. 1,401 ft. San Luis Obispo County.

#### Newhall District

H. T. Purman 1 Needham ..... 13-3n-16w
Grading road and location. Rained out. Expect production around 1,500 ft. to 1,600 ft. Elev. 1,681 ft. Los Angeles County.

# New Pettus Sand Discovery Near Normanna, Bee County

By
F. L. SINGLETON

CORPUS CHRISTI, Tex., Feb. 24.—A probable new Pettus sand discovery in Bee County; completion of a second producer in the new Willamar field, Willacy County, and the running of casing in a deep test offshore from Aransas County in St. Charles Bay, featured developments in the Southwest Texas district.

A new Pettus sand strike in Bee County was indicated as J. R. Dougherty was running 7-in. casing in 7 R. T. Hicks, a wildcat located about 3 miles southwest of the town of Normanna. Sand with a show of oil was cored at 4,169-78 ft., the total depth, and casing was being cemented for a production test following a 10-minute drill-stem test at 4,170-78 ft., which tested 270 lb. working pressure, and recovered 80 ft. of oil and gas-cut mud, and 20 ft. of pipe-line oil. The well is located in the J. M. Uranga Survey on strike with other Pettus sand fields.

## SUMMARY OF COMPLETIONS

| | No. | Bbl. | Footage |
|---|---|---|---|
| ***Lower Gulf Coast District*** | | | |
| Oil wells: Stratton | 4 | 499 | 26,961 |
| Other fields | 10 | 1,395 | 56,812 |
| Dry holes: Fields | 3 | ..... | 18,696 |
| Wildcats | 1 | ..... | 5,510 |
| Total | 18 | ..... | 107,879 |
| ***Laredo District*** | | | |
| Oil wells: Fields | 4 | 388 | 11,348 |
| Gas wells: Fields | 2 | ..... | 5,033 |
| Dry holes: Fields | 6 | ..... | 17,064 |
| Wildcats | 5 | ..... | 10,764 |
| Total | 17 | ..... | 44,209 |
| ***San Antonio District*** | | | |
| Oil wells: Fields | 4 | 227 | 4,361 |
| Dry holes: Wildcats | 1 | ..... | 2,566 |
| Total | 5 | ..... | 6,927 |

*Willamar.*—The new Willamar field, Willacy County, was extended approximately 1,000 ft. southeast as Pan American 1-B Community flowed 56 bbl. of oil in 16 hours through a 7/8-in. choke, while testing through perforated casing at 7,855-80 ft. Tubing pressure was 2,150 lb. Gravity of the oil tested 32.6°. This is the second producer for the field, and the completion apparently opens a new producing horizon in the Frio section inasmuch as the discovery well is producing from a sand section at 7,620-78 ft.

### Deeper Exploration

A trend toward deeper exploration in the Corpus Christi area is evident by recent developments. The latest deep test to attract attention is Humble 1-27 State in St. Charles Bay, offshore from Aransas County, which logged sufficient showings below 8,000 ft. to cement casing for a production test. This well was drilled to a total depth of 10,341 ft., and the company was attempting to run casing to 8,350 ft., where pipe was dropped to bottom, and the company is now fishing. While details of the core record of this well are not available, several showings below 8,000 ft. are reported to have been cored.

*Red Fish Bay.*—Another marine operation is scheduled to be started by the same company as location was made in Red Fish Bay for 1-246 State, 2,800 ft. from the north line and 467 ft. from the east line of the tract, which places the location about 5 miles northeast of Aransas Pass in Aransas County. Most of this bay has been under lease for some time, and the present well will be the second test to be drilled. Practically all other bays and other submerged state-owned lands along this particular sector are under lease, and with the approach of expiration dates on most of the leases, a steady increase in this type of development is anticipated.

*Luby.*—With the recent discovery of a new sand in the basal Frio section in the Luby field, Nueces County, together with the testing of a deep test in the St. Charles area, and the showing of oil and gas from a deep sand in the East Flour Bluff field, Nueces County, is believed to have increased the potentialities of the area considerably. In the St. Charles area, Aransas County, Continental Oil Co. is in the process of testing a deep sand at 9,200 ft. in 3 St. Charles Bay, while in the East Flour Bluff field, Nueces County, Humble 6-D State is bottomed at 8,570 ft., and the progress has been held up due to excessive gas pressures which resulted in the drill stem becoming stuck. At the present depth this well is considerable deeper than the normal pay, and sufficient showings are believed to have been logged below 8,000 ft. to result in a producing well should the company decide to test at the present depth.

### Second Test

*Robstown.*—In the Robstown field, Nueces County, Jay Simmons is rigging up for 1 E. W. Naumann, located in the M. L. De Herrera grant, George H. Paul Subdivision D of the Driscoll ranch in Block 3. The well is being drilled on a farmout lease from Shell Oil Co., and it will be the second test to be drilled in the area by the operator within the past few months. Only two wells produce at Robstown, and several attempts to extend production resulted in failures, and the field at the present time rates as a third-rate structure.

*Wade City.*—An attempt to extend production in the Wade City field, Jim Wells County, will be made by Bridwell Oil Co., which is moving in material for 1 N. W. Lagging, 1 mile west of the field in Block 10, F. S. Schleischer subdivision in the J. Poitevent Survey.

*Coloma Creek.*—Locations for three wells were announced for the new Coloma Creek field, Victoria County, as McSpadden Co. moved in material for 1-B Archie Clark, 1,300 ft. west of the discovery well, a gas-distillate producer which was completed the first of the year in sand at 5,900 ft. Location for 2-B Clark was made south of the discovery, while 2 Clark was staked south of 1-B Clark. North of the discovery well, tentative locations are reported to have been made by A. H. Garner.

*Carrizo.*—New activity was reported for the Carrizo field, recently opened in Dimmit County. Walton Drilling Co. and Producers Corp. staked location for 1 McKnight & Kirk in Survey 652, while Spencer & Huck staked location for 1 Catlett McKnight in Survey 652, both tests being located northwest of the townsite of Carrizo Springs. Southeast of the discovery, H. H. Weinert started drilling operations on 1 Arnold Kirk in Survey 52.

### SOUTHWEST TEXAS COMPLETIONS
### LOWER GULF COAST DISTRICT

**Jim Wells County**

Henshaw field: Henshaw 1-B Grossman, dry, T.D. 5,910 ft.

Wade City field: Rodney DeLange 6 McNeill, 205 bbl., 7/8-in. choke, perf. casing 4,906-17 ft., T.D. 4,923 ft. Rodney DeLange 17 McNeill, 216 bbl., 7/8-in. choke, perf. casing 4,928-33 ft., T.D. 4,940 ft. Magnolia 7 Schmidt, 80 bbl., 1/4-in. choke, perf. casing 4,903-05 ft., T.D. 4,916 ft.

Wildcat: Lee Johnson 1 Singer, dry, T.D. 5,510 ft.

**Nueces County**

Agua Dulce field: H. H. Howell 2 Schultz, 330 bbl., 1/4-in. choke, perf. casing 6,498-6,510 ft., T.D. 6,555 ft.

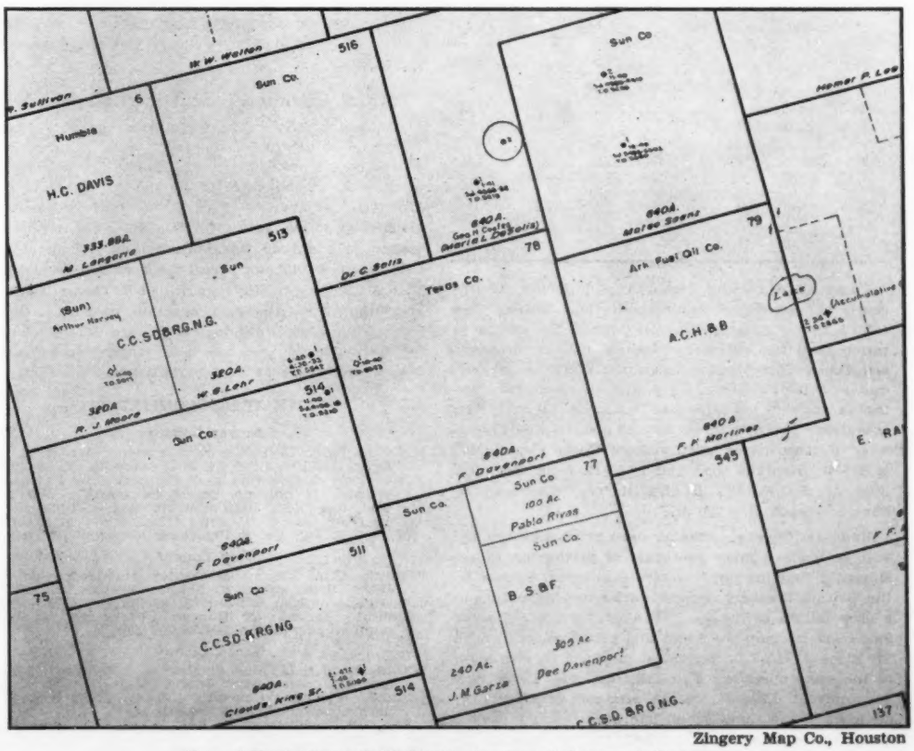
Clara Driscoll field: E. A. Graham 1 Gandy, 122 bbl., 1/8-in. choke, perf. casing 5,835-40 ft., T.D. 6,010 ft.

Richard King field: Southern Minerals 18 King, 87 bbl., 7/64-in. choke, perf. casing 5,602-07 ft., T.D. 5,608 ft. Southern Minerals 5 Walker, 75 bbl., 7/64-in. choke, perf. casing 5,644-49 ft., T.D. 5,650 ft.

Shield field: Stanolind 1 Baldwin, 118 bbl., 1/2-in. choke, perf. casing 6,620-22 ft., T.D. 6,624 ft.

Stratton field: Bay-Tex Oil Corp. 8 Union Central Life Ins. Co., 171 bbl., 1/8-in. choke, perf. casing 6,525-35 ft., T.D. 6,812 ft.

*(Continued on Page 119)*




Zingery Map Co., Houston

***Map of North Rincon field showing location of deep-sand discovery***

## NORTH CENTRAL TEXAS

# Six New Deep Wildcats Keep Interest in Play

By R. MARNE SANFORD

WICHITA FALLS, Tex., Feb. 24.—The Fort Worth basin play and general widespread deep exploration which has marked North Texas' weekly activity for the past 6 to 8 months has, on the whole, not yielded the returns which were expected at the time of its start. Several very prolific deep conglomerate and deep lime fields were opened during the latter half of 1940 and during the early months of 1941, however, many costly failures were drilled in some of the previously thought most prospective areas of the district.

For the past month to 6 weeks the number of new deep wildcat locations has steadily fallen off and the play has been thought to be materially subsiding. The six new locations this week for wildcat tests were in the most separated counties of the district and not concentrated in the southern Montague and southeastern Clay counties area which heretofore received such intense exploration.

New wildcat locations projected to the deep levels were staked in Cooke, Montague, Wilbarger, Clay, Parker and Young counties during the past 7-day period. Their contract depths range from 3,000 to 6,500 ft. and all are expected to get under way at once.

### SUMMARY OF COMPLETIONS

*North Texas*

| | No. | Bbl. | Footage |
|---|---|---|---|
| Oil: Hull-Silk field | 2 | 840 | 59,99 |
| Walnut Bend field | 3 | 1,002 | 14,057 |
| Cooke field | 2 | 17 | 1,993 |
| Voth field | 2 | 528 | 2,566 |
| K.M.A. field | 6 | 2,977 | 21,042 |
| K.M.A. deep field | 1 | 720 | 4 400 |
| Olney field | 3 | 76 | 2,356 |
| Wildcats | 2 | 30 | 5,113 |
| Other fields | 7 | 2,573 | 17,553 |
| Gas: Wildcat | 1 | *2.25 | 5,347 |
| Dry: Olney field | 2 | ..... | 1,709 |
| Other fields | 3 | ..... | 5,918 |
| Wildcats | 2 | ..... | 4,607 |
| Total | 36 | ..... | 92,660 |

*West Central Texas*

| | | | |
|---|---|---|---|
| Oil: Sayles field | 3 | 603 | 5,872 |
| Other fields | 3 | 1,404 | 7,634 |
| Dry: Fields | 4 | ..... | 8,035 |
| Wildcats | 5 | ..... | 8,701 |
| Total | 15 | ..... | 30,242 |

*Million cu. ft.

*Cooke County.*—The Texas Co., which has just recently announced the failure of its long drilling deep test, 1 Hutchinson, in Grayson County, has staked location for 1 Peter Bindel, a 3,000-ft. test in northwestern Cooke County. The Grayson County failure was quit at a total depth of 5,545 ft. with no definite geological markers yet released. It was drilled as a tight operation. The new test is located about 5 miles northwest of Muenster in northwestern Cooke County and is 330 ft. from the west and 1,530 ft. from the north lines of the Francis Hughes Survey, Abstract 439. Contract depth is 3,000 ft.

*Montague County.*—Another deep production attempt will be made 2 miles southeast of production in the Ringgold field of northwestern Montague County by the Benson Brothers of Bowie who just recently quit a deep failure in the area. The new test is 1 Wilmer Seay, 330 ft. from the south and east lines of Section 31, Block 4, H.&T.C. Survey, about 4,000 ft. northwest of the same operators' 1 Joe Benton, Abel Lewis Survey, quit at 6,213 ft. in the Simpson of Upper Ordovician. Some shows of oil had been found in a conglomerate section from 5,819-42 ft. just below the Nocona lime, however, only water was recovered on tests. The new wildcat is contracted to 6,200 ft. and is scheduled to start in the near future.

*Wilbarger County.*—Plans for a 5,500-ft. wildcat test 2 miles west of Tolbert in Wilbarger County were released by W. B. Omohundro, Wichita Falls. The operator has acquired a block from E. S. Smith, Jr., geologist of Vernon, and plans to start the deep test as soon as acreage spreads have been portioned out to Continental, Amerada, Deep Rock, and several other companies supporting the test. The location has been set for the center of Section 29, Block 16, H.&T.C. Survey.

*Clay County.*—L. T. Burns, Wichita Falls, who in 1939 opened the Browning field in southwestern Clay County and who has taken a lead in deep drilling throughout the county for the past 2 years, has staked location for another Caddo lime test. It is 1 Fred Wines, 467 ft. from the east and 593 ft. from the north lines of Block 1, Halsell subdivision, about a mile southeast of the townsite of Halsell. The test should be closely watched since it is only 2 miles south of the steadily developing Halsell field from the 4,700-ft. level and is only about 1½ miles north of a one-well discovery of last year by Horton & Wiggins and Phillips Petroleum Co. from the Bend lime at 5,484 ft. Burns holds a small block of less than 1,000 acres in the area.

*Parker County.*—Reports were made at the close of the week that a 6,500-ft. wildcat test was being planned for the area 5 miles north of Weatherford in Parker County. Plans for drilling the test are credited to Plains Production Co., Dallas, with location set for the Earl Allen farm about ½ mile south of an old failure which showed some oil at the 3,600-ft. level. The location is on an 8,000-acre block. Exact location with footage from lines was not given.

*Young County.*—L. T. Burns, Wichita Falls, has moved in derrick and is starting a new 5,200-ft. Caddo lime wildcat 3 miles south of Olney in Young County. It is located 500 ft. from the north and west lines of a 200-acre tract in the E. J. Larrimore farm, Section 210, T.E.&L. Survey. It is 2 miles east of a 5,018-ft. failure by Hull & Silk in Block 180, drilled several years ago.

### Tarrant County Wildcat Indicated Failure

Believed a failure, Bruce Sullivan and Hill & Hill 1 Putnam, Milley Gilbert Survey, 5 miles north of Fort Worth in Tarrant County, was shut down preparatory to quitting at the close of the week. The test was drilled to a total depth of 7,836 ft., found barren, plugged back and tested from 6,704-40 ft. A possible section of gas lime was indicated on survey of the hole, however, did not reveal itself on drill-stem tests. This is the deepest hole ever drilled in Tarrant County, and although not finding production, should aid greatly in assembling a geological picture of the county for future testing on the many large blocks taken during the lease play of 6 months ago.

### NORTH TEXAS COMPLETIONS

**Archer County**

Hull-Silk field: Deep Oil Development and R. & G. Drlg. Co. 10 Little, 24 bbl. pumping, 1,366-70 ft.
Blackwell Oil & Gas and Helmerich & Payne 11 Wilson, 34 bbl. an hr., ¾-in. choke, 1,500 gal. acid, top Caddo lime 4,567 ft., pay 4,612-29 ft.
Archer field: Guy J. Brown 1 Hughes, dry at 2,000 ft.
M. L. Drilling Co. 8 Prideaux, abandoned location.

**Clay County**

Wildcat: Akin, Dimock & Costley 1 Patrick, Sec. 82, Byers Bros. subd., 20 bbl., naturally, 1,101-12 ft.
Clay field: Johnson & Kouri 3 Taylor, dry at 1,338 ft.
Duncan, Arnhold & Duncan 19 Duncan, 65 bbl., pumping, naturally, 1,185-1,207 ft.

**Cooke County**

Walnut Bend field: Sinclair Prairie 5 Ramsey, 75 bbl. in 5 hr., open tubing, 4,783-5,011 ft.
Sinclair Prairie 1 Cox "A," 128 bbl. in 13 hr., open tubing, naturally, 4,758-4,991 ft.
Sun Oil 10 Snuggs, 80 bbl. in 4½ hr., pumping, naturally, 4,037-55 ft.
Cooke field: C. & L. Oil 22 Perkins, 10 bbl., pumping, naturally, 804-15 ft.
Bridwell Oil 8 Trew "A," 7 bbl., pumping, 10-qt. shot, 1,173-78 ft.
Voth field: James C. Roberts 2 Sicking, 40 bbl. in 4 hr., pumping, naturally, 1,285-1,300 ft.
Whitfield, Pearson & Grimes 8 Sicking, 48 bbl. in 4 hr., naturally, 1,238-66 ft.

**Jack County**

Wildcat: Rathke Oil 1 Moseley, John Harrison Sur., Abst. 259, 2,250,000 cu. ft. gas daily, 70-qt. shot 4,498-4,545 ft., P.B. from 5,347 ft., T.D.
Mathis field: J. A. Worsham 2 Leach, 250 bbl. in 6 hr., ½-in. choke, 15-qt. shot, 2,880-93 ft.
Bryson field: Paul P. Steed 2 Derrick, 355 bbl. in 12 hr., open tubing, naturally, 3,096-3,109 ft.

**Montague County**

Rogers & Rogers field: Stanolind 1 Miller, 81 bbl. in 3 hr., ¾-in. choke, naturally, 5,258-73 ft., T.D. 5,350 ft.

**Wichita County**

Wildcat: R. D. Dorian 1 Ancell, Sec. 36, Blk. 5, H.&T.C. Sur., dry at 4,077 ft.
Perry Browning 1 Warren, Sec. 32, W.V.F.L. Sur., 10 bbl., 1,491-1,501 ft. and 1,760-72 ft., P.B. from 4,001 ft., T.D.
K.M.A. field: Mid-Union Drlg. Co. 4 Fassett & Tuttle, 42 bbl. in 5 hr., ¼-in. choke, 250-qt. shot, 4,004-65 ft.
Mid-Union Drlg. Co. 5 Fassett & Tuttle, 62 bbl. in 3 hr., ¾-in. choke, 100-qt. shot, 3,737-53 ft.
Mulberry Oil 8 Bradley, 55 bbl. in 3 hr., ¾-in. choke, 3,775-3,810 ft.
Coppack & Coleman 2 Warren, 9 bbl., pumping, 1,495-1,506 ft.
Shell 19 Griffin, 146 bbl. in 3 hr., ¼-in. choke, 165-qt. shot, 3,762-3,846 ft.
K.M.A. Deep field: Shell and Phillips 20 Griffin, 43 bbl. in 1½ hr., open tubing, top Ellenburger 4,251 ft., dolomite 4,390-4,400 ft., pay 4,251-4,339 ft. in Ellenburger lime.
Wichita field: Akin, Dimock & Costley and Storey 1 Waits, 40 bbl., pumping, 1,312-17 ft. and 1,322-30 ft.

**Wilbarger County**

K.M.A. field: J. A. Woods 4 Womack, junked and quit at 2,580 ft.

**Young County**

Wildcat: Echols & Fentress 1 Baker, R. L. Richardson Sur., Abst. 1852, dry at 530 ft.
Olney field: Charles B. King 3 Brown, 4 bbl. daily, pumping, 15 sticks dynamite 547-56 ft. and 10 sticks at 541-56 ft.
H. N. Tucker 1 Howard, dry at 803 ft.
Kimmell Lee & Co. 1 Campbell "C," to be a key well for repressuring, T.D. 975 ft.
P. B. Worthington 4 Clark, 50 bbl. daily, pumping, 864-83 ft.
P. B. Worthington 5 Clark, dry at 906 ft.
Burma Pet. 1 Dunagan, 22 bbl. pumping, naturally, 910-17 ft.
Bloodworth field: L. T. Burns 7 Bloodworth, 75 bbl., pumping, naturally, 876-83 ft.
Young field: Panhandle Refg. 4 Taylor, 35 bbl., pumping, 30-qt. shot 2,768-81 ft.

### NORTH TEXAS WILDCAT REPORT

**Archer County**

W. B. Hamilton 22 Cartwright, 660 ft. from W and S lines, James Webb Sur., Abst. 664, T.D. 5,211 ft., P.B. 5,164 ft., 60-qt. shot 5,149-61 ft., swabbing est. 10 bbl. oil per day, S.D.
Walter Gant 1 Hunter, SE NW Sec. 7, Blk. 1, H.&T.C. Sur., top Ellenburger 5,370 ft., set 7-in. at 5,370 ft., T.D. 5,391 ft., filled 30 ft. in 12 hr., 15-qt. shot and acidized with 3,000 gal. 5,381-91 ft., testing for completion 5,148-5,208 ft.
King Oil 1 Taylor, Lot 1, Sec. 13, A.T.N.C.L. Sur., show oil 4,995-5,020 ft., 5½-in. set 4,970 ft., top Ellenburger 4,963 ft., perf. casing 4,926-36 ft., treated 2,000 gal., prepare to complete in Mississippian lime from 4,926-36 ft.
H. F. Smiley 1 Larr, SW NW Sec. 136, H.S. of C.R. Sur., 1,400-ft. test, S.D. 1,102 ft.
Adams Oil & Gas 1 Powell, SE Lot 14, Sec. 1, S.P.R.R. Sur., Abst. 406, 5,200-ft. test, drilling 4,896 ft.
Deep Oil and Christie 1 G. Moer, SW SW Sec. 21, Clark & Plumb subd., Blk. 3, 4,600-ft. test, drilling 4,314 ft.
Shappell Oil 15 Lyles, NW NE Sec. 7, Hooper & Wade Sur. Abst. 234, 4,800-ft. test, drilling 4,510 ft.
W. B. Hamilton 1 C. E. Graham C, SE part of Gibenrath Sur., Abst. 136, 2,000-ft. test, S.D. 1,975 ft., prepare to drill deeper.
Jack Story, Jr., 1 L. F. Wilson, NE Lot 4, Sec. 86, A.T. N.C.L. Sur., 1,600-ft. test, 7-in. at 1,543 ft., show oil 1,543-50 ft. in sand.
Home Oil 1 Spain, NE Sec. 8, Meade Pasture subd. 55, 1,400-ft. test, location.
Consolidated Oil 1 Humphrey, 467 ft. from S and W lines of E. S. Heath Sur., Abst. 176, 4,400-ft. test, moving in material.
Petroleum Producers 1 M. Lynch, 2,310 ft. from W and 330 ft. from S lines, Sec. 20, Palo Pinto C.S.L. Sur., 10-in. at 116 ft., drilling 2,345 ft.
George Keith 1 Prideaux, SW Sec. 1867, T.E.&L. Sur., 900-ft. test.
Magnolia 1 Hayton, SE SE SE Sec. 2415, T.E.&L. Sur., 5,400-ft. test.

**Baylor County**

Hattie B. Madden 2 J. J. James, Sec. 150, T.&N.O. Sur., show oil 1,352-63 ft., lost drill pipe 2,308 ft., S.D.
Rogers & Lanfair 1 Howe, J. Howe Sur., Abst. 572,

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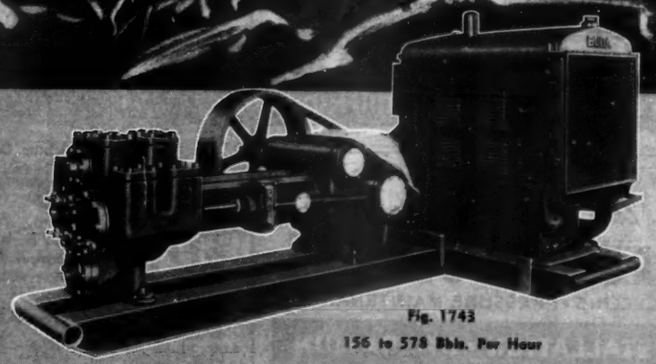

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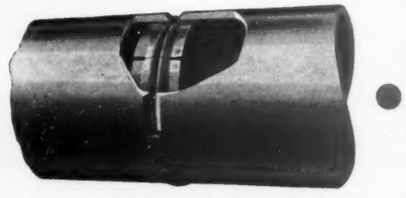

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show oil 1,445-52 ft., S.D. 3,115 ft., T.D., may drill deeper.

British American Oil 1 Claude Owens, SE SE Sec. 102, T.&N.O. Sur., Abst. 1311, 2,600-ft. test, top lime 2,537 ft., 4 -in. 2,535 ft., T.D. 2,547 ft., P.B. 2,542 ft.

**Clay County**

Carlos Wagner 1 L. C. Thaxton, Sec. 2, T.&N.O. Sur., 6,500-ft. test, drilling 5,006 ft.

Petroleum Producers 1 O. O. Ross, Sec. 8, J. Wyont Sur., Abst. 902, T.D. 5,584 ft., pumping 5 bbl. oil per day, S.D.

Bridwell Oil 1 W. H. Myers, C. Thompson Sur., Abst. 444, 5,500-ft. test, drilling 3,710 ft.

Gulf 1 C. W. Scaling, NW NW Sec. 31, T.&N.O. Sur., Abst. 685, 6,000-ft. test, drilling 2,610 ft.

L. T. Burns 1 Southerland, NE cor. of 100 acres, of Sec. 63, J. H. Belcher Sur., 5,500-ft. test, drilling 2,850 ft.

**Denton County**

Amon G. Carter 1 W. P. and A. P. Allen, S. Westbrook Sur., T.D. 9,025 ft., prepare to make D.S. test, no oil show reported at T.D. (tight well), 10,000-ft. contract depth, top Ellenburger 8,785 ft., P.B. 5,345 ft., S.D.

**Cooke County**

R. P. Farris 1 Houston, 3,500 ft. from S and 3,600 ft. from E lines of Charles DeMorse Sur., Abst. 332, 1,800-ft. test, T.D. 956 ft. (last report).

Bridwell Oil 1 Joe Fisher "A," Lot 11, John Barnett Sur., Abst. 42, 2,100-ft. test.

**Hood County**

W. G. Martin 1 W. G. Thorman, E cor. of 2,956-acre ranch, F. F. Anderson Sur., 5,000-ft. test, spudded and S.D.

Aztec Oil 1 Gallagher, SW SE Robert Alway Sur., 3,000-ft. test, drilling 2,200 ft., last report.

**Jack County**

Continental 1 Robertson, M. J. Swan Sur., Abst. 1659, top Ordovician 5,380 ft., T.D. 5,577 ft., P.B. 5,397 ft., swabbing oil and water, top bridged, cleaned out.

R. A. Conkling 1 M. Hoffle, A. James Sur., Abst. 318, 3 mi. S of Antelope, 3,500-ft. test, T.D. 3,128 ft., pulled 7-in., will rerun after reaming hole.

K. N. Davis 1 Jones, NW cor. E½ Sec. 2555, T.E.&L. Sur., 1 mi. SE Perrin, 2,500-ft. test, moving in rig.

Noah Davis 1 Rankin, E½ Sec. 2555, T.E.&L. Sur., moving in materials.

Harper-McClintock 1 Kinder, 1,400 ft. from E and 467 ft. from N lines, Sec. 2667, T.E.&L. Sur., drilling 1,352 ft.

O. J. Perrin 1 Brumbelow, 1,045 ft. from S and 720 ft. from E lines, H. C. Ayers Sur., Abst. 4, S.D. 3,505 ft. after electrical survey.

Continental 1 Johnson, N part of D. D. Burton Sur., Abst. 1671, 5,500-ft. test, drilling 2,848 ft.

Reed & Craft 1 Richards, 467 ft. from W and 1,200 ft. from N lines of C. Gates Sur., Abst. 237, 3,500-ft. test, location.

C. H. Peterson 1 Hoefle, SE cor. John W. Barrett Sur., Abst. 48, 500-ft. test, 8-in. at 228 ft., 7-in. at 325 ft., drilling 350 ft.

**Montague County**

Walter Gant 1 Will Laird, R. T. Millard Sur., Abst. 470, 7 mi. W of Sunset, T.D. 6,651 ft., P.B. to 6,596 ft., perf. casing 4,865-73 ft., best gage for 125 bbl., swabbing in 6 hr. after S.I. for 10 days, rotary moved off, S.D.

J. G. Hammond 1 Jester, 84-acre tract in E Wingate Sur., Abst. 835, 2 mi. W of Mallard, top Caddo lime 6,282 ft., drilling 7,176 ft.

Sinclair Prairie 1 W. G. Hawkins, 631 ft. from N and 330 ft. from E lines of farm in Sec. 17, H.&T.C. Sur., 3 mi. SE of Ringgold, top Ellenburger 5,806 ft., S.D. 5,910 ft.

T. F. Hunter and Wilcox O. & G. 1 Barcas, SE Sec. 78, Kaufman C.S.L. Sur., Abst. 407, 3,600-ft. test, drilling 3,160 ft.

Redman Brothers 1 Hardy, 225 ft. from N and E lines of 41-acre tract in Fielding Secrest Sur., Abst. 665, 2,500-ft. test, rigging up rotary.

**Tarrant County**

Bruce Sullivan 1 W. C. Putnam, 200-acre tract in Milley Gilbert Sur., T.D. 7,836 ft., testing gas show 7,604-50 ft.

**Throckmorton County**

Homer Moore and J. E. Dodson 1 J. O. Crump, Blk. 956, T.E.&L. Sur., location.

Humble 1 Allie McKnight, 1,100 ft. from N and 660 ft. from E lines, Sec. 2, D.L.&C. Sur., Abst. 1264, 5,000-ft. test, drilling 2,815 ft.

A. B. Bissey 1 W. L. May, NW SW Sec. 916, T.E.&L. Sur., Abst. 322, 610-ft. test, location.

Humble 1 Durham, NW NW Sec. 1627, T.E.&L. Sur., top Caddo 4,182 ft., 5½-in. at 4,413 ft., T.D. 4,428 ft., treated 2,000 gal., swabbed salt water, may retreat, P.B. depth 4,413 ft.

**Wichita County**

King Oil 1 Ancell, 330 ft. from N and E lines of C. L. Gibbs Sur., Abst. 390, 4,000-ft. test, show oil 3,000-03 ft., 6⅝-in. 3,000 ft., show oil 3,609-84 ft., T.D. 3,837 ft., P.B. 3,680 ft., S.D.

Underwood 1 E. D. Owens, SW SW Sec. 40, Specht & McCutchin subd., 1,250-ft. test, location.

**Wilbarger County**

W. H. Gant 1 Mock, Sec. 23, Blk. 11, H.&T.C. Sur., 6,000-ft. test, drilling 1,747 ft.

Ray Brothers 1 Henry Streit, 72-acre tract in S. N. Gosnel Sur., Abst. 1231, S.D. 2,058 ft., carried 7-in. casing to T.D.

Amerada 1 Harrell, NW NE Sec. 37, Blk. 15, H.&T.C. Sur., 4,800-ft. test.

**Wise County**

Manahan Oil 1 E. R. Collier, J. M. Wade Sur., Abst. 868, corrected depth 7,500 ft., prepare to drill ahead below 6,047 ft., repairing rig.

**Young County**

E. Lennington 1 Perry, 165 ft. N of C of river and 46 ft. from W line of 126-acre A. W. Perry farm in Oliver T. Brown Sur., Abst. 25, S.D. 165 ft.

Ben H. Rankin 1 Mary Logan, SW part Blk. 2, J. W. Doty Sur., 8 mi. NE Graham, 2 mi. W Nelson field, drilling 4,350 ft.

Dorian & Farrell 1 Grigsby, Sec. 416, T.E.&L. Sur., 7-in. 3,972 ft., show oil 3,979-89 ft., bailed 1½ gal. oil per hour, T.D. 4,991 ft., P.B. 3,989 ft., shot 40 qt., made 3 bbl. oil in 1½ hr., testing.

Hayden 1 Casey, 700 ft. from S and E lines, Sec. 1,396, T.E.&L. Sur., 900-ft. test, drilling 702 ft.

C. D. Willis 1 Stewart D, 1,411 ft. from N and 1,057 ft. from W lines, David Dawson Sur., Abst. 76, 950-ft. test, S.D. repairs 475 ft.

E. L. Orr 1 Edwards, 1,170 ft. from N and 450 ft. from E lines, Sec. 1481, T.E.&L. Sur., 950-ft. test, top Gunsight lime 867 ft., show oil 899-903 ft., testing.

H. R. Loftin 1 Loftin, SW cor. 80-acre tract in Ann Wood Sur., Abst. 1274, 600-ft. test, rigging up.

Frank Buttram 1 Holmes, 600 ft. from W and 1,960 ft. from S lines, J. M. McRodgers Sur., Abst. 1878, 4,000-ft. test, drilling 3,705 ft.

## WEST CENTRAL TEXAS

FORT WORTH, Tex., Feb. 24.—Jones County is becoming increasingly active and increasingly prolific as the past week accounted for one new producing spot and a new deep pay for another recently opened field, together with two new wildcat locations.

The new field discovery was Fain-McGaha Oil Corp. et al 1 J. Moore, 660 ft. from the east and 1,320 ft. from the south lines of the T. Maltby Survey. The well opened a new field and a new pay level 1 mile south of the old five-pay level Hawley field. The Hope sand was topped at 2,208 ft. with best saturation from 2,213-19 ft., total depth being 2,225 ft. Early in the week the well was estimated good for 35 bbl. daily, naturally, based on bailing tests of 1 bbl. hourly. Tubing had been run at the close of the week for initial tests. It is on a 1,200-acre block assembled by Fain-McGaha Oil Corp., Wichita Falls, with the geological work being done by Claude Daily, Fort Worth. Ungren & Frazier, drilling contractors of Abilene, also hold an interest in the discovery.

*Stith.*—Indicating the discovery of a slightly deeper producing horizon in the Stith field of southern Jones County, Danciger Oil & Refining 2 Kelso, Subdivision 82, De Witt C.S.L. Survey, offset to the 1 Kelso, discovery well, is preparing to test. The original discovery was completed for 209 bbl. daily from the Flippen sand at 2,341 ft., however, the 2 Kelso passed up this level with only slight shows and drilled into saturation in what has been tentatively called the Swastika lime at 2,773 ft. Five feet of penetration was taken at which point free oil was bailed from the hole. Casing has been cemented at 2,770 ft.

*Wildcats.*—New wildcat for the county was the Fain-McGaha Oil 1 O. J. Cooper, a 3,000-ft. test to be drilled 4 miles northeast of Hawley and 330 ft. from the north and west lines of the SW¼ Section 29, Block 15, T.&P. Survey. The other new operation for the county is W. W. Fondren 1 C. P. Rogers, a projected 3,100-ft. Swastika lime test located 1,401 ft. from the north and 467 ft. from the east lines of a 126-acre tract in N½ Section 32, Block 18, T.&P. Survey.

## New Wildcat Locations

*Hamilton County.*—Groover & Rose, contractors and operators of Albany, Tex., have staked location for 1 Joe Fuqua, 1,600 ft. from the west and 640 ft. from the south lines of the J. W. Bowers Survey, 15 miles northwest of the town of Hamilton in Hamilton County. It is contracted to 3,000 ft. and will be drilled with cable tools.

*Brown County.*—Four miles northwest of Banks in Brown County J. O. Hart & Son, Fort Worth, has staked location for 1 Sallie, a 1,350-ft. test located on a 157-acre tract in Section 10, Moses Little Survey.

*Shackelford County.*—E. M. Doloach has staked location for his 1 Cook, a projected 1,300-ft. wildcat test located 660 ft. from the south and east lines of SE¼ NE¼ Section 64, E.T. R.R. Survey. Also in Shackelford County a shallow 775-ft. wildcat test in N. Grossenbacher and C. D. Hagerty 1 Elliott, located 450 ft. from the south and 330 ft. from the west lines of Section 12, L.A.L. Survey.

### WEST CENTRAL TEXAS COMPLETIONS

**Callahan County**

Wildcat: L. A. Warren and Eastland Oil 1 Ross, N½ SE Sec. 98, B.B.B.&C. Sur., dry at 1,253 ft.

**Coleman County**

Wildcat: McDonald & Campbell 2 Stafford, NW part of B. Alderman Sur., top show gas 1,315-17 ft., top Caddo lime 1,440 ft., dry at 1,520 ft.

**Jones County**

Stith field: Danciger Oil & Ref. 1 Gale, show oil 2,695-2,702 ft., dry at 2,730 ft.

Wildcat: G. M. Gillespie 2 Young, SW NE NE Sec. 53, O.A.L. Sur., dry at 2,260 ft.

T. D. Humphrey 1 Norwood, 2,100 ft. from N and 330 ft. from W lines of E½ Sec. 18, Blk. 15, T.&P. Sur., dry at 2,950 ft.

Akard field: Hedrick Oil 1-D Akard, 152 bbl. daily, ¾-in. choke, 2,127-40 ft.

Sayles field: F. K. Johnson 4 Sayles, Jr., 165 bbl. daily, open tubing, natural, 1,935-51 ft.

F. K. Johnson 6 Sayles, Jr., 282 bbl. daily, open tubing, natural, 1,939-46 ft.

Lewis Prod. 19 Sayles, Jr., 156 bbl. daily, open tubing, natural, 1,962-75 ft.

Lewis field: Petroleum Prod. 6 Bryant-Link, 260 bbl. daily, pumping, 3,000 gal. acid, 1,873-86 ft.

**Shackelford County**

Hamby field: F. O. Akin 2 Powers, dry at 1,636 ft.
Wildcat: Choate 1 Myrick, NW Sec. 47, B.O.A. Sur., dry at 718 ft.
Ivy field: Fortex Oil 1-A McKeever, dry at 3,249 ft.
Snyder field: Charles Midkiff 1 Dorser, dry at 420 ft.

**Stephens County**

Loving field: Whittmer Oil & Gas 1 Compton, 124 bbl., 3 hr., ¾-in. choke, 3,000 gal. acid, 3,567-3,608 ft.

## WEST CENTRAL TEXAS WILDCAT REPORT

**Brown County**

A. J. Stokes 1 B. S. Bayston, 210 ft. from SE line and 2,962 ft. from SW line of Prosper Mangel Sur. 604, drilling 1,601 ft.
R. Richmond 1 Petros, SW SW Sec. 7, H.T.&B. Sur., 1,200-ft. test, drilling 780 ft.

**Callahan County**

W. D. Austin 1 I. N. Jackson, 150 ft. from N and W lines, Sec. 2, C.&M. Sur., underreaming casing 850 ft.
B. C. Mann 1 Windham, 990 ft. from N and 330 ft. from W lines, SE Sec. 154, G.H.&H. Sur., show oil 980-85 ft., T.D. 1,006 ft., prep. quit.
Reeves & Sorrell 1 Young, 1,980 ft. from N and 660 ft. from E lines, Sec. 37, B.B.B.&C. Sur., H.F.W. 1,975-2,000 ft., 6⅝-in. 2,000 ft., waiting on cement.

**Coleman County**

A. P. Heinze 1 J. Kincaid, 467 ft. from N and W lines of E½ SW Sec. 41, B.B.B.&C. Sur., 3,800-ft. test, rigging up spudder 3,647 ft.
L. J. Derrick 1 J. W. Vance, 330 ft. NW of old Texas 1 Vance, also in Sec. 101, E.R. Sur., 2,100-ft. test, location.
R. H. Murray 1 Morris, 467 ft. S and W of NE 160 acres of J. Greenwood Sur. 304, S.D. 1,305 ft., corrected.
M. R. Stuard 1 Minear, 330 ft. from N and 1,850 ft. from E lines of 300-acre tract in E. Votaw Sur. 244, location.
Cooper Brothers 1 McClure, 1,100 ft. from S and 2,400 ft. from W lines of T. R. Frizzell Sur. 711, 2,800-ft. test, rigging up rotary.

**Comanche County**

Campbell 1 Stark, SW part of Asa Hoxey Sur., S.D. repair 145 ft., will set 6⅝-in.

**Concho County**

Floyd C. Dodson 1 Robert Wilson, Thomas Green Sur., 10 mi. SW Eden, show oil and gas 3,792-95 ft., 3,819-20 ft., at 3,828-29 ft. showed 1 bailer water per hr., will deepen 500 ft.

**Eastland County**

Hickok Oil 1 Luse & Gray, NE Sec. 486, S.P. Sur., Ordovician test, ¾ mile SE of new McElreath field, 4,250-ft. test, drilling 2,678 ft.
A. A. Hutton 1 W. Penn, NW SE Sec. 11, Blk. 2, B.B. B.&C. Sur., 600-ft. test, drilling 510 ft.
Douglas Tomlinson, Jr., et al 1 Bennett, NE NE NE Sec. 6, Blk. 2, H.&&T.C. Sur., 900-ft. test, T.D. 810 ft., S.D. weather.

**Erath County**

W. A. Young 1 J. B. Mills, J. Harvey Sur., 5 mi. NW of Dublin, T.D. 212 ft., cleaning out hole.

**Fisher County**

F. A. Stephenson 1 Maberry, SE SW Sec. 56, Blk. 1, H.T.&B. Sur., 3,400-ft. test, cored 3,285-3,302 ft., recovered sand showing oil, top Swastika 3,277 ft., 40-gravity oil, deepened to 3,315 ft., 1,500 bbl. oil in storage, making est. 200 bbl. oil per day.
General Crude Oil 12 Flanigan, center of old Royston field, Ordovician test, changed to cable tools at 5,945 ft., drilling 6,165 ft.
F. A. Stephenson 1 Humphries, NW NW Sec. 49, Blk. 1, H.T.&B. Sur., 2,350-ft. test, top lime 2,985 ft., dry lime 1,985-92 ft., T.D., waiting on spdr.
P. R. Long 1 W. F. Davidson, SE NW Sec. 59, Blk. 1, H.T.&B. Sur., 4,300-ft. test, S.D. 100 ft.
Landers & Eisele 1 Mose Newman, SE NW Sec. 8, Blk. 20, T.&P. Sur., drilling 1,830 ft.

**Hamilton County**

A. J. Caldwell 1 W. W. Jones, 1,002 ft. from NE, 150 ft. from SE lines, W. H. Crowder Sur., drilling past bit 3,002 ft., last report.
Falls Ref. Co. (formerly Wallace & Vickers) 2 Lund, C S½ of 20 acres of N½ of SW¼ R. J. Bailey Sur. 51, T.D. 3,953 ft., prepare to P.B. to shut off 9 bbl. sulfur water per hr from 3,863-3,953 ft., top Ellenburger 3,853 ft.
Gunther & Smith 1 Thompson, 467 ft. from SE and 4,533 ft. from SW lines of Rhody Kennedy Sur., spudded and S.D.
Hensley & Watson 1 Manning, 467 ft. from W and 2,500 ft. from S lines of Apago Gaithan Sur., rotary on location.

**Jones County**

Shaheen Oil 1 Young, 1,630 ft. from N and 300 ft. from E lines, S. Andrews Sur. 191, 2,500-ft. test, drilling 1,924 ft.
Danciger O. & R. 1 H. F. Gale, NE NE Subd. 91, De Witt C.S.L. Sur., 2,500-ft. test, drilling 2,460 ft.
H. Hines and W. D. Brookover 1 A. N. Wimberly, SW SW Subd. 91, De Witt C.S.L. Sur., 2,500-ft. test, drilling 1,410 ft.
Fain-McGaha Oil 1 Moore, 660 ft. from NE and 1,320 ft. from SE of S 107 acres of J. D. Maltby Sur. 252, 2,500-ft. test, saturation 2,215-21 ft., prep. complete on pump, est. 25 bbl. oil per day, naturally.
Danciger Oil & Ref. 1 Jacob Foster, SE¼ W 100 acres, SW¼ Sec. 13, Blk. 13, T.&P. Sur., 3,000-ft. test, prep. set casing to shut off water 2,050 ft.
J. C. Hunter 1 Minter, N½ Lot 7, Sec. 192, Robert Smith Sur, 2,400-ft. test.

**McCulloch County**

W. J. Willard 1 E. B. Garrett, 467 ft. from N and E lines of Sur. 934, Abst. 1196, 3,000-ft. test, drilling 675 ft.
Clark 1 Lively, SE cor. Sec. 931, H. F. Hetzfeldt Sur., 650-ft. test.

**Palo Pinto County**

Wilcox O. & G. 1 Rogers, 467 ft. from E and E lines, Sec. 894, T.E.&L. Sur., S.D. for orders, 3,330 ft.
Georgian Oil 1 Weldon, A. J. Smith Sur., Abst. 383, H.F.W. 2,121 ft., T.D.

*(Continued on Page 119)*


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# First Trenton Oil East of Lima Is Found in Erie County, Pa.

By STAFF CORRESPONDENT

NEWARK, Ohio, Feb. 24.—Trenton is showing oil in the northwestern Pennsylvania deep test located in Springfield Township, Erie County, Lot 4. Ohio Oil Co. 4 Jay Childs struck the top of Trenton at 4,437 ft. and encountered showings of light green oil with some gas in the top of this formation; shut down after drilling 60 ft. in, to run casing. Other tests drilled to this formation in Pennsylvania as well as northeastern Ohio have failed to find any showings at this horizon. A small gas showing was had in the Clinton horizon in this test, sand measurements are red Clinton 2,630-65 ft., dry, white Clinton 2,665-85 ft., 15,000 cu. ft. gas.

## SUMMARY OF COMPLETIONS

**Ohio**

| | No. | Bbl. | Footage |
|---|---|---|---|
| Oil | 0 | ..... | ..... |
| Gas | 11 | *7.4 | 26,290 |
| Dry | 3 | ..... | 6,050 |
| Total | 14 | ..... | 32,340 |

***Indiana***

| | | | |
|---|---|---|---|
| Oil wells | 5 | 615 | 10,952 |
| Gas wells | 1 | ..... | 905 |
| Dry holes | 4 | ..... | 10,018 |
| Total | 10 | ..... | 21,875 |

***Eastern Kentucky***

| | | | |
|---|---|---|---|
| Gas wells | 2 | *1.8 | 4,580 |

*Million cu. ft.

***Western Kentucky***

| | | | |
|---|---|---|---|
| Oil wells | 2 | 25 | 731 |
| Dry holes | 2 | ..... | 4,145 |
| Total | 4 | ..... | 4,876 |

Only 14 tests were completed in the Ohio fields this week, 11 gas wells and 3 dry holes, no oil wells. Ashland, Knox, and Tuscarawas each had fair wells, gaging better than a million cubic feet, open flow.

*Deep tests.*—Brendal Producing Co. has a rig on location for its second deep test in Harrison County, 2½ miles southeast of Tappan in NW NW Section 20, Stock Township, Muskingum Conservancy district tract.

Ohio 1 J. H. Armstrong, Wayne County, Wooster Township, is drilling in the lime at 2,875 ft.

In Mahoning County, Smith Township, Magnolia 1 D. Shrum is drilling in the lime at 3,250 ft.

**Ashland County**

Orange Township: Ohio Fuel 2 Mary Gantz, Sec. 13, 1,120,000 cu. ft. gas, Newburg, T.D. 2,530 ft.

**Athens County**

Todi Township: A. D. Townsend 2 William Snodgrass, Sec. 5, 60,000 cu. ft. gas, second Berea, shot, T.D. 1,738 ft.

Rome Township: Brooks Johnson 2 Harvey Starlin, Sec. 30, dry, Maxon (water), T.D. 1,030 ft.

**Knox County**

Danville corporation: Ewing et al 1 Ellen Magers, Sec. 5, 680,000 cu. ft. gas, Clinton, T.D. 2,797 ft.

Ohio fuel 1 J. T. Smithhisler, Sec. 5, 1,900,000 cu. ft. gas, Clinton, T.D. 2,787 ft.

**Lorain County**

Avon Township: William Dempsey 1 Emma Baldauf, Sec. 14, dry, Clinton sand missing, T.D. 2,480 ft.

**Guernsey County**

Liberty Township: George Jewell 1 William Mathers, Sec. 16, 230,000 cu. ft. gas, shot, Ohio shales, pay 1,490-1,578 ft., T.D. 1,638 ft.; (completed with tools in the hole).

**Medina County**

Spencer Township: East Ohio Gas Co. 1 White & Jackson, dry, Clinton, T.D. 2,540 ft.

**Monroe County**

Sunsbury Township: H. B. Walker Co. 1 C. F. McDougal, Sec. 33, 100,000 cu. ft. gas, shot, Berea, T.D. 2,240 ft.

**Morgan County**

Marion Township: W. S. Harris 1 Dick Granstaff, Lot 1, 320,000 cu. ft. gas, shot, Brill, T.D. 1,020 ft.

**Muskingum County**

Wayne Township: Ohio Fuel 2 Ayers Mineral Co., Sec. 4, 420,000 cu. ft. gas, Clinton, T.D. 3,820 ft.

**Noble County**

Beaver Township: Ohio Fuel 2 A. E. Bashford, Sec. 29, 475,000 cu. ft. gas, Berea, T.D. 1,710 ft.

**Tuscarawas County**

Franklin Township: Columbia Carbon Co. 1 George Smith, Sec. 9, 1,500,000 cu. ft. gas, shot, Clinton, T.D. 4,417 ft.

**Washington County**

Barlow Township: Baker & Daly 4 George Green, Sec. 10, 600,000 cu. ft. gas, Squaw, T.D. 1,533 ft.

## INDIANA

EVANSVILLE, Ind., Feb. 24.—The possibilities of adding a new pay horizon to the South Griffin field by the completion of Continental 15 Keck, SE NE SE 27-3s-14w, St. Louis test in Gibson County, proved disappointing when representatives of the company announced that after two acid treatments the lime proved too tight for commercial production. The well is now shut down awaiting orders. It will probably be deepened to the Salem. Northeast of 15 Keck, Continental 28 Bozeman, SW SW NE 23-3s-14w, also failed to get a commercial show in the St. Louis and is drilling ahead to the Salem.

Ed Holemans 1 Mumford, a closely watched Posey County wildcat in SE NW NE 6-4s-13w, was drilling at 2,300 ft. at the end of the week. This well encountered saturation in the Palestine sand at 1,700-20 ft.

An important Knox County wildcat, C. L. McGuire 1 Bland, SE NE SE 15-5n-10w, was dry and abandoned last week. Hole was bottomed at 3,055 ft. after being drilled through the Devonian which was topped at 2,810 ft. No shows were found.

### INDIANA COMPLETIONS

**Gibson County**

South Griffin pool: Continental 24 Bozeman, SE SW NE 23-3s-14w, pumped 96 bbl., naturally, T.D. 2,871 ft.

Continental 2 Kleiderer, SW SE NW 26-3s-14w, pumped 384 bbl., 30-qt. shot 2,767-99 ft., T.D. 2,799 ft.

**Jay County**

Trenton pool: A. M. Jones 1 White, NE NE NE 25-24n-12e, pumped 3 bbl., 60-qt. shot 1,001-45 ft., Trenton 981 ft., T.D. 1,085 ft.

Wildcat: Petroleum Dev. Corp. 1 J. Binegar, NE NE NW 29-24n-13e, dry, T.D. 3,404 ft.

**Knox County**

Oaktown pool: C. L. McGuire, Inc., 1 Bland, SE NE SE 15-5n-10w, dry, New Albany 2,682 ft., Devonian 2,810 ft., T.D. 3,055 ft.

**Newton County**

Wildcat: Nat. Consumers Oil 1 Tyler, NE NE NW 4-31n-8w, location abandoned.

Vaughn & Smith 1 Bogle, NE NW NE 5-31n-8w, dry, T.D. 1,120 ft.

**Posey County**

Point pool: McCummings et al 1 Oakland City College, NW NW SE 16-8s-14w, pumped 60 bbl., 60-qt. shot 2,550-68 ft., T.D. 2,569 ft.

Heusler pool: R. B. Creager et al 2 Welborn-Struch, SE SE NE 1-7s-12w, pumped 72 bbl., 30-qt. shot 1,721-30 ft., T.D. 1,732 ft.

Wildcat: Gulf Refg. Co. 2 Dickhaut, SW SW SW 5-6s-12w, dry, T.D. 2,439 ft., P.B. 700 ft.

**Rush County**

Wildcat: Jesse Patton 2 fee, SW NW NE 19-12n-10e, location abandoned.

**Spencer County**

Rockport pool: Kentucky Nat. Gas et al 3 Scamahorn, NW NE NW 29-7s-6w, 14,164,000 cu. ft. gas, pay 891-905 ft., T.D. 905 ft.

### INDIANA DRILLING REPORT

**Crawford County**

J. C. Barnett 1 Baylor.....SE SE SW 22-1s-2e New Albany 1,035 ft., S.D. 1,200 ft.

**Gibson County**

P. W. Harr et al 1 Weber.....NE NE SW 32-2s-9w S.D. 1,789 ft.

J. P. Shaw 1 Witherspoon.....NE NW 20-1s-11w Drilling 1,780 ft.

**Huntington County**

Beauchamp 1 Mayer Grain.....SE NW SW 22-29n-8e S.D. 1,186 ft.

**Knox County**

Amalagene, Inc. 1 Moray, 1,200 ft. NW line, 450 ft. NE line, Donation 75, set 10-in. 34 ft., waiting on cement.

**Monroe County**

Terry Deskins 1 Kinser.....SW SW NW 34-7n-1e Spud.

**Newton County**

A. C. Thomas 1 Heneke.....SE SE SE 36-30n-9w Set 10-in. 110 ft., drilling 195 ft.

**Pike County**

P. W. Harr et al 1 Burnett.....SW NW NE 26-2s-8w S.D. 1,880 ft.

**Posey County**

H. G. Lewis et al 1 New Harmony Realty Co.....NW NW NW 6-5s-13w Set 10-in. 40 ft., Kincaid 1,739 ft., Menard 1,975 ft., Glen Dean 2,320 ft., drilling 2,400 ft.

Ed Holemans 1 Mumford.....SE NW NE 6-4s-13w Drilling 2,300 ft.

Anderson et al 1 Welch.....NE NE NE 10-4s-14w Glen Dean 2,367 ft., Aux Vases 2,779 ft., slight show oil 2,856-66 ft., Ste. Genevieve 2,899 ft., drilling 2,958 ft.

Ed Holemans et al 1 Oeth.....NE SE NE 6-4s-13w T.D. 2,981 ft., P.B. 2,925 ft., swabbing water.

**Starke County**

R. B. Dambiyer 1 Francois.....NE NE SW 5-32n-2w Location.

**Spencer County**

J. B. Miller et al 1 Dooley.....NW NE NW 19-7s-7w Rig.

H. M. Hunt et al 1 Spain.....E½ SE SW 32-7s-6w S.D. 600 ft.

**Sullivan County**

E. M. Self 1 James Land.....NE NE NE 36-7n-9w Spud.

A. S. Reed et al 1 Coffman.....NE NE NE 36-7n-9w Spud.

A. S. Reed et al 1 Coffman.....S½ S½ NE 35-8n-10w Set 10-in. 30 ft., 8-in. 120 ft., drilling 550 ft.

**Vanderburg County**

T. W. Drake 1 Nurrenbern.....SE NE NE 6-7s-14w Set 10-in. 81 ft., drilling 330 ft.

**Vigo County**

Sage & Farley 1 Campbell.....S½ NE NW 24-11n-8w S.D. 1,664 ft.

## EASTERN KENTUCKY

ASHLAND, Ky., Feb. 24.—Deep-test drilling, in the eastern Kentucky spotlight for the past few months, received one setback this week in Martin County. A well on the Sam Endicott farm on Little Laurel Creek, being drilled by E. E. Cunningham et al, turned out to be a dry hole after going to a total depth of 4,850 ft.

This is probably one of the deepest wells to be drilled in the Martin-Floyd-Lawrence area although in actual footage it may have been surpassed by a well drilled in the Big Blaine region in 1929. The latter well, Thomas Fraley No. 1, 9 miles northwest of the Cunningham well, was drilled to a depth of 4,975 ft. and was dry in a "shelly" shale.

However, the Cunningham well, because of different location on the eastern Kentucky structure, is probably the deepest stratigraphically in the eastern part of the state.

After shooting both the Berea and shale, without production, Cunningham decided to test the Clinton. He reports it took 55 days to go from shale to bottom of the Clinton. The Cunningham rig has been moved about 1½ miles and he is drilling a shale well on the Endicott tract.

Scattered deep-test drilling has been under way in this part of the state in recent months as an aftermath of an intensive leasing campaign which attracted wide attention about a year ago. In the majority of cases "wildcat" operators have been engaged in most of the deep tests, often failing to find production at expected levels and going on down until operations ceased for one reason or another.

The Schmidt well, near Hazel Green in Knox County, several wells in Morgan County, and a few in other fields, have been deep tests.

One deep test in under way on the Chism farm, south of Ruckerville in Clark County. W. O. Allen and W. W. McClure, operators, are headed for a St. Peter sand test, according to information received here. This well is already down over 3,900 ft.

Cumberland Petroleum, now drilling with the aid of several interested concerns, is making a deep test of No. 44 on the L. C. Bailey farm, at State Road Fork near Oil Springs, in Magoffin County. Interest was centered on this well after the 3,750-ft. mark was reached.

**Floyd County**

Kentucky-West Virginia Gas Co. 604 James Howell, on Prater Creek, 1,302,000 cu. ft. gas, R.P. 350 lb., 12 hr. after acid, Big lime 1,630 ft.

**Martin County**

Kentucky-West Virginia Gas Co. 5284 J. G. Carlisle, on Coldwater Branch, 462,000 cu. ft. gas, white slate at 2,950 ft.

## WESTERN KENTUCKY

**Butler County**

Huntsville district: Cumberland et al 5 Ora Brown

*(Continued on Page 113)*

# Oil Showings Near Edna Keep Jackson County in Limelight

By NEIL WILLIAMS

HOUSTON, Tex., Feb. 24.—W. S. Boyle and J. G. Mayo 1 Terrell, a wildcat located north of the town of Edna in the William Murphy Survey, Jackson County, continued to keep this area in the limelight of Texas Gulf Coast operations as casing was cemented for a production test. Drilled to a total depth of 6,025 ft., 5½-in. casing was cemented at 3,986 ft. following an electrical survey which is reported to have shown favorable indications in two sand sections, but details as to where these sands were logged were not available. No cores of the two sand sections were made and no showings of oil or gas have been reported.

*La Ward.*—In the same county, and located in the newly opened La Ward field, Humble 1 Fred S. Robbins, an offset to the discovery well, is bottomed at 5,216 ft. and 5½-in. casing is being cemented for completion. Sand and shale showing gas was cored at intervals from 5,160-90 ft., while sand showing oil was cored in the discovery zone at 5,210-16 ft.

*Ganado.*—Texas 1 Selleman, a deep test in the Ganado field, Jackson County, is bottomed at 7,662 ft. and 7-in. casing is being cemented for completion. This well is located about 1,000 ft. west of the company's 3 Mortgage Land & Investment Co., and a recent test in a new sand section below the discovery pay at 5,000 ft. recovered several hundred feet of pipe-line oil.

*Halls Bayou.*—Strake Petroleum Co., Inc., 1 Griffith, a prospective pool opener located in the Halls Bayou area, Brazoria County, was in the final stages of completion. This well showed for a pool opener earlier in the week when it flowed at the estimated rate of 10 bbl. of fluid per hour through a ⅛-in. choke of which 88 per cent was amber-colored distillate and 12 per cent brackish water and 2,830,056 cu. ft. of gas per day. Tubing pressure was 4,000 lb. and gravity of the distillate tested 58°. The well is bottomed at 10,333 ft., with 7-in. casing cemented at 10,328 ft. The showing of salt water is believed to be due to an unsuccessful cementing job, inasmuch as 1,800 ft. of cement was found in the casing when plug was drilled. The casing was recemented and at the end of the week tubing was being run for another test.

### SUMMARY OF COMPLETIONS

| | No. | Bbl. | Footage |
|---|---|---|---|
| Oil wells: West Ranch | 6 | 2,778 | 32,958 |
| Other fields | 14 | 3,028 | 94,949 |
| Gas wells: Fields | 1 | | 5,234 |
| Dry holes: Wildcats | 1 | | 6,507 |
| Total | 22 | | 139,648 |

### Offshore Drilling

*Red Fish Reef.*—The Red Fish Reef field, offshore from Chambers County in Galveston Bay, received an important extension and new sand discovery. The extension is Humble 8-A-223 State, 1,143 ft. northeast of production, and flowed at the rate of 4 bbl. of pipeline oil per hour through a ⅛-in. choke while testing through perforated casing at 9,367-72 ft. Total depth of the hole is 10,924 ft. Offsetting the discovery well, Humble 9-A-263 State, flowed 104 bbl. per day from perforated casing at 10,990-95 ft. This is the fourth and deepest sand to be found in the field. Approximately 1,300 ft. southeast of this well, Gulf 1-R-224 State is testing through perforated liner at 10,506-11 ft. Total depth of the hole is 11,000 ft.

Reported showings of oil and gas have attracted considerable attention to British American Oil Producing Co. 2-71 State, a wildcat located offshore from Jefferson in the Gulf of Mexico. Shale and sand with a good oil odor was cored at 4,872-75 ft., shale and sandy shale with an oil odor at 4,886-94 ft., and sand with a slight odor was logged at 4,894-4,900 ft. The well is drilling ahead in shale below 4,910 ft. Sidewall cores were cut the previous week at 3,485-4,724 ft. following an electrical survey, but details were not available.

*Magnolia.*—Commercial production from two additional sand sections in the Wilcox formation was indicated by Superior Oil Co. of California 1 McWhorter, located in the Magnolia area, Montgomery County. First production was opened the previous week at 8,930-35 ft. when the well flowed 180 bbl. of 39.2-gravity oil per day through a 12/64-in. choke on top and ¼-in. choke on bottom. A 5-hour drill-stem test through perforated casing at 8,827-32 ft. recovered 3,320 ft. of 37-gravity oil, while at the close of the week the well was flowing an estimated 150 bbl. of distillate plus 8 per cent salt water per day while testing through perforated casing at 9,212-17 ft. This well is bottomed at a total depth of 9,314 ft. and 7-in. casing was cemented at 9,312 ft. following an electrical survey which showed several sand sections in the Wilcox which was topped at 8,464 ft. Whether the well will be completed through the present perforations or continue to test other sand sections was not revealed.

The showing of this well together with other favorable recent developments along the trend has resulted in an increase in geophysical activity, and there is little doubt exploration along the trend will show a large increase over the preceding year.

### TEXAS GULF COAST COMPLETIONS

**Brazoria County**

Old Ocean field: Stanolind 1 R. D. MacDonald, 73 bbl., ¼-in. choke, perf. casing 10,100-50 ft., T.D. 11,025 ft.

West Columbia field: Gulf 8 Mays, 303 bbl., ¼-in. choke, top sand 5,724 ft., T.D. 5,738 ft.

**Chambers County**

Anahuac field: Humble 49 Middleton, 163 bbl., ¼-in. choke, top sand 7,236 ft., T.D. 7,240 ft.

**Fort Bend County**

Thompson field: H. M. Naylor 11-B F. I. Booth, 155 bbl., ⅛-in. choke, top sand 7,782 ft., T.D. 7,810 ft.

**Galveston County**

League City field: Phillips 9 L. G. Lobit, 234 bbl., ⅛-in. choke, perf. casing 8,681-99 ft., T.D. 9,350 ft.

**Harris County**

Humble field: Wilson Oil Co. 4 Holmes, 118 bbl., pumping, top sand 1,100 ft., T.D. 1,111 ft.

Fairbanks field: Stanolind 13 Jahnke, 140 bbl., ⅛-in. choke, top sand 6,832 ft., T.D. 6,840 ft.

Tomball field: Humble 23 Reid, 42 bbl., ¼-in. choke, top sand 5,546 ft., T.D. 5,563 ft.

**Jackson County**

Lolita field: W. L. Goldston 31 Missouri Pacific Railroad, 143 bbl., 7/64-in. choke, perf. casing 5,930-34 ft., T.D. 6,408 ft.

Humble 11-A L. Ranch, 480 bbl., ¼-in. choke, sand 5,277-82 ft., T.D.

Magnolia 10 Mitchell, 160 bbl., 5/32-in. choke, T.D. 5,285 ft.

West Ranch field: Midstates 2 Benneview, 597 bbl., ¼-in. choke, perf. casing 5,757-64 ft., T.D. 5,766 ft.

W. S. Boyle 2 L. Ranch, 431 bbl., ¼-in. choke, perf. casing 5,563-75 ft., T.D. 5,634 ft.

Magnolia 115-A West, 557 bbl., ¼-in. choke, perf. casing 5,087-5,103 ft., T.D. 5,104 ft.

Magnolia 130-A West, 207 bbl., ¼-in. choke, perf. casing 5,567-70 ft., T.D. 5,576 ft.

Magnolia 131-A West, 539 bbl., ¼-in. choke, perf. casing 5,120-26 ft., T.D. 5,127 ft.

Magnolia 2 Tr. No. 6 West Ranch-State, 447 bbl., ¼-in. choke, sand 5,745-49 ft., T.D. 5,751 ft.

Wildcat: Crosby Drilling Co. 1 Gayle, dry, T.D. 6,507 ft.

**Jefferson County**

Fannett field: Gulf 8 Bordages, 779 bbl., ¼-in. choke, top sand 8,367 ft., T.D. 8,382 ft.

**Matagorda County**

Hamman field: Hamman Exploration Co. 1 Minter, 177 bbl. oil and 40 bbl. salt water, top sand 9,204 ft., T.D. 9,368 ft.

**Wharton County**

Hillje field: Texas 1 Appling, gas well, perf. casing 5,224-34 ft., T.D. 5,234 ft.

Magnet field: Humble 34 Cockburn, 61 bbl., ⅛-in. choke, sand 5,542-47 ft., T.D.

### TEXAS GULF COAST DRILLING REPORT

**Brazoria County**

Fred Browning 1 Rodgers, Charles Garrett Sur., drilling shale 7,480 ft.

**Hardin County**

W. G. Christian 1 Gueydry, M. Chavans Sur., drilling shale and lime 7,030 ft.

**Harris County**

H. C. Cockburn et al 1 Hugh Meyer, Rueben White Sur., drilling shale 4,300 ft.

*(Continued on Page 113)*

## Permian Basin, Panhandle

*(Continued from Page 98)*

Huber Pet. Corp. 12 Weatherly, 2,658 bbl. on gas lift, 2,989-3,037 ft.

Kewanee Oil & Gas 51 Lewis-Badger, 227 bbl., 2,907-3,003 ft., 370-qt. shot.

Paloma Oil 8 Lewis, 218 bbl., 2,945-3,010 ft., 420-qt. shot.

Shell 10 Harvey "B," 275 bbl., 2,990-3,049 ft., 85-qt. shot.

**Moore County**

Shamrock Oil & Gas 1 Makeig, 147,000,000 cu. ft. gas, 2,965-3,155 ft., 7,000 gal. acid in three stages.

Shamrock Oil & Gas 1 Powell-Magnolia, 260,000,000 cu. ft. gas, 2,945-3,049 ft.

**Wheeler County**

Magnolia 7 Worley, 113 bbl., 2,408-30 ft., naturally.

Skelly Oil 18 Derrick, 159 bbl., 2,400-48 ft., 645-qt. shot.

## SOUTHEAST NEW MEXICO

HOBBS, N. M., Feb. 24.—New blocking and leasing in Otero County and prospects of a new wildcat test held attention in that district the past week.

Sloan & Zook Co., Bradford, Pa., secured option on a large block in the southeastern part of the county and have announced intention of starting a test. Option was secured from J. W. McMillen and Fred Turner, who held about 30,000 acres in one block, mostly fee land. The Pennsylvania company took leases on half of the large block and are reportedly planning a 5,000-ft. test. From sections measured at the outcrop in the nearby mountains, this depth should test all possible sections from the San Andres lime, through the Permian, Pennsylvanian, Mississippian, Devonian, Silurian, and Ordovician sections. The acquired block centered in Townships 25s and 26s and Ranges 16e and 17e, and is on the north end of the Sierra Diablo Plateau. The San Andres lime, the main producing formation of the north part of the Permian basin of West Texas, is the outcropping surface formation in this area.

Also drawing some attention to Otero County is the report that Atlantic Refining Co. and American Liberty Oil Co. have blocked some 116,000 acres in the Tularosa basin, mostly in government leases, and being in Townships 13s, 14s, 15s, and 16s and Ranges 6e, 7e, and 8e. Several surface geological parties and an aerial mapping crew is reported to be working the block.

### SOUTHEAST NEW MEXICO COMPLETIONS

**Lea County**

Hover 1 State, NE NE 32-17s-32e, T.D. 3,965 ft., 400 bbl. oil.

Devonian 1 Dean-State, SE SE 23-17s-35e, location abandoned.

Argo 3-B Texas State, NW SE 16-20s-32e, T.D. 2,604 ft., 85 bbl. 8 hr.

Skelly 15 Sims, SE SE 33-22s-37e, 80 bbl., T.D. 3,680 ft.

### SOUTHEAST NEW MEXICO WILDCAT REPORT

**Chaves County**

L. E. Elliott 1 State ..... NW NE 16-11-31
Top anhydrite high at 1,206 ft., rigging up spudder to drill ahead.

Roxana Oil 1 Maull ..... NE NW 11-12-25
Setting 8¼-in. at 624 ft.

A. F. Pierce 1 Franks ..... SE NW NW 17-9-25
T.D. 990 ft., P.B. 887 ft., shot 40 qt. 864-87 ft., testing.

Holmes-Martin 1 Stephens ..... C NW NE 22-15-29
Old well drilling deeper, T.D. 3,210 ft.

H. Steinberger 1 Headley ..... NW SW 26-14s-29e
T.D. 3,405 ft., sulfur water 3,400-05 ft.

R. T. Wilson 1 L. B. Brown ..... C NW SW 29-11-23
Drilling 710 ft.

**Eddy County**

G. M. Cone 1 Hare ..... NW NW NE 11-16-28
Old well drilling deeper, T.D. 1,830 ft., showing est. 250,000 cu. ft. daily, testing.

Mac T. Anderson 1 Brainard ..... NE NE 28-18-27
Drilling 2,391 ft.

Jack Harris 1 Josey ..... SW SE 19-20-23
T.D. 643 ft.

Jones & Yates 1 Everest ..... NE SE 15-18-26
270-qt. shot 1,934-84 ft., and 670-qt. shot 1,485-1,710 ft., set new casing, preparing to complete.

Fulton 1 Johnson ..... NW SE 22-19-27
T.D. 1,849 ft., P.B. 1,645 ft., 230-qt. shot 1,752-1,845 ft., filled 400 ft. with oil and water after being cleaned out, 5½-in. casing at 1,442 ft., swabbed 27 bbl. oil, 5 hr., pumping 20 bbl. daily, treated 2,000 gal., est. 30 bbl. oil per day, testing on pump.

Truett & Tallmadge 1 Rudahl ..... NE SE 2-20-24
Drilling 2,186 ft.

Jones & Yates 1 Pickrell ..... SW SW SW 5-19-26
Drilling 610 ft.

Trojan Oil 1 Grant ..... SW NE 33-20-25
Drilling 2,378 ft.

Dooley & Haynes 1 Martin ..... SE NW 9-19-25
T.D. 1,000 ft., cementing off water.

W. A. Suddreth 1 Willis ..... NW SE 14-20-28
Drilling 220 ft.

**Otero County**

Otero Oil 1 State ..... SE NW 5-22-10
Reaming 8¼-in. at 1,190 ft., T.D. 1,240 ft.

R. H. Ernest 1 Located Land Co. ..... SE SE 20-25-7
T.D. 3,843 ft.

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# Among the Drilling

MOHICAN Drilling Co. 1 Bryant, SW SW NW 7-6-8, Seminole County, Oklahoma, is dry after testing a shallow showing at 1,225 ft. Gilcrease sand was topped at 3,129 ft. and drilling halted at 3,190 ft.

CARL SHORT, Dallas, Tex., contractor, spent several days last week in the Illinois basin fields.

ALLEN & MORRIS, San Antonio, Tex., received contracts for three wells, and drilling had been started at the end of the week. In Jackson County, and located in the West Ranch field, 2 Robertson was spudded for Blutch Oil Co., while in Calhoun County, and located on state lease No. 153, drilling was started for the Coronado Corp. and in Refugio County 1-B Rooke was spudded for the same company. In Louisiana, drilling continues below 7,440 ft. at Herman Brown 1 Louisiana in Bienville Parish.

GEORGE ECHOLS opened a new field in coastal Louisiana with the completion of his 1 Natalbany Lumber Co., located on the St. Gabriel prospect, Iberville Parish. Seven-inch casing was cemented on bottom at 9,031 ft., and production was obtained by perforating casing at 7,766-76 ft. This is the second new field to be opened by the contractor within recent weeks, the other being the Westwego field, just west of New Orleans in Jefferson Parish.

WALTON Drilling Co. and Producers Corp. have started operations on 1 McKnight & Kirk, a Dimmitt County, Texas, project in Survey 652, near the new Carrizo field.

JOE HARTMANGRUBER of San Antonio, Tex., has contracted to drill a well for H. H. Weinert about 4½ miles west of Carrizo Springs, in the new Dimmitt County, Texas, producing district. The location is ¾ mile southeast of the discovery producer.

DELTA Drilling Co. and Sells Petroleum Co. have ceased drilling in 1 Beckham, Wood County, Texas, wildcat operation 5 miles northeast of Mineola. The hole is bottomed at 7,506 ft. The last 1,000 ft. of hole drilled was primarily for geological data.

CROSBY Drilling Co., Houston, Tex., has apparently opened a new field for the Texas Gulf Coast as Strake Petroleum Co., Inc. 1 Griffith located in the Halls Bayou area, Brazoria County, showed for a producer when tested at 10,328-33 ft. Tubing was being run for a final production test at the close of the week. In the Glenmora area, Rapides Parish, 1 Phillips is drilling below 7,400 ft. and is reported to be checking structurally high.

GRAY & WOLFE, Houston, Tex., continues to test Superior Oil Co. of California 1 McWhorter, the discovery well of a new Wilcox field in Montgomery County, and production from two additional sand sections was indicated during the week.

M. & M. Drilling Co., of Abilene, Tex., has farmed out to Schooler & Norman a 40-acre lease in Section 25, Block GG, H.E.&W.T. Survey, Crockett County. No cash was involved but Schooler & Norman agreed to start operations within 30 days.

O. W. DYER, Houston, Tex., is in the process of testing Continental 3 St. Charles, located in the St. Charles area, Aransas County. Drilled to a depth of 11,472 ft., which is one of the deepest drilled in the Corpus Christi area, production tests are being made below 9,200 ft.

FITZWATER Drilling Co. is moving in for a test on the Carrie Mosely land in the I. N. James Survey, southwest of Smithland, Marion County, Texas.

MORRIS-HAMILTON Drilling Co., Houston, Tex., is drilling below 6,500 ft. in W. R. Davis 2-C Albrecht, located in the Weser area, Goliad County. In the same area, a production test was being made at 2-B Albrecht, after sand was cored in the discovery pay at 5,200 ft.

OLSON Drilling Co., Tulsa, is moving on location for 1 Jones, SE SW SE 5-5-10, a rotary test in the Calvin Beeker area, Hughes County, Oklahoma.

HENDERSON COQUAT, San Antonio, Tex., is drilling below 3,900 ft. in the Clara Driscoll field, Nueces County, for Texas Conservative Oil Co. 2 Huie, an outpost test. The contractor has two additional rigs running in Duval County.

BIG CHIEF Drilling Co. et al 1 Strange, SW SE 27-18-4w, Logan County, Oklahoma, wildcat, has been completed for 7,000,000 cu. ft. of gas daily. The hole was carried to

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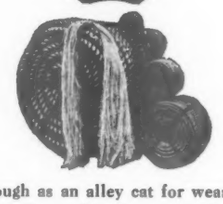

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# Contractors

5,125 ft. and then plugged back to 3,580 ft. Production was developed by perforating from 3,350-60 ft.

CARPER Drilling Co., Artesia, N. M., brought in a 280-bbl. well of its own this week in Lea County, New Mexico, at 3-A Simon in Section 29-17s-32e in the Maljamar pool.

RED IRON Drilling Co., Gladewater, Tex., who drilled 1 Prince for A. A. Folsom, is preparing to carry the hole to Paluxy. It was dry in the Woodbine, limiting extent of that pay on the west in the Hawkins field, Wood County, Texas.

HOUSTON Drilling Co., Houston, Tex., is preparing to core below 5,000 ft. in O. C. Garvey 1 Charles Horner, a projected Wilcox test located in the Willis area, Montgomery County. Another rotary is running for the Gem Oil Co. in the Hillje field, Wharton County, for Gem Oil Co.

BIG WEST Drilling Co., Dallas, Tex., will drill another wildcat for British-American Oil Co. in Sharkey County, Mississippi, near the recent British-American 4,000-ft. dry hole in 23-11n-7w. The new location is almost inaccessible at present.

GLOBE Drilling Co. has contract to drill Floyd G. Hoag 1 Charles G. Stark in 21-1n-15w, Allegan County, Michigan.

TRINITY DRILLERS, Inc., of San Antonio, Tex., has assigned a heavy-duty rig to McSpadden Co. of Houston which is to start immediately on development of the newly discovered Coloma Creek field in Calhoun County.

UNGREN & FRAZIER, Abilene, Tex., contracting firm, will drill a wildcat test east of the Noodle Creek field in southeastern Jones County, Texas, for W. W. Fondren of Houston. The Fondren test will be on the C. P. Rogers farm 1¼ miles south and a little west of Humble Oil & Refining Co.'s two-pay field.

WEST, HUDSON & VEEDER, Cherryvale, Kans., have the contract to drill an important test in Harlan County, Nebraska, the second test of the year in the Saline basin, where a play is expected in the next few months. The test is to go to the Arbuckle dolomite. It will be drilled for Ohio Oil Co. in N½ SE NW 15-2n-18w on G. C. Battin's farm.

HAYNES OWNBY Drilling Co. has started operations on its 1 South Texas Cotton Oil Co., a new test in Victoria County, Texas.

LEONARD BLOOD, Mount Pleasant, Mich., contractor, is preparing to test Boswell & Blackmer 1 Cousins, ½-mile-west-extension effort for the North Adams field, Arenac County, Michigan. The test had Dundee at 2,853 ft. and casing was set at 2,888 ft.

DALE SMITH, Coleman, Tex., contractor, has spudded an extension test to the Novice field in northwestern Coleman County, Texas, for Barney Carter on the Mary I. Dunham ranch. Contract calls for drilling to 4,600 ft.

*F. M. Brasher, driller, and Henry Guynes, floor man, at a Magnolia Petroleum Co. rig in the Seminole field of Gaines County, West Texas*


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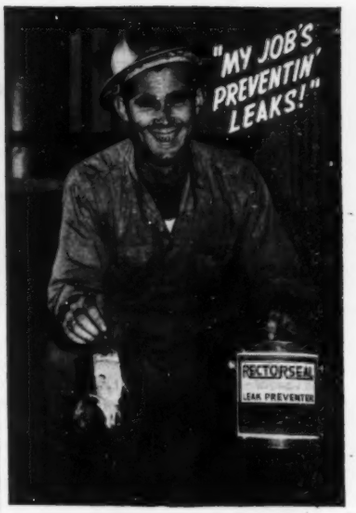


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By
ROBERT INGRAM

# Drilling Up in Proven Areas; Wildcatters Swing North

DESPITE bad weather and soggy roads, drilling went on at a good clip in Kansas during the week, particularly in proven areas. Wildcatting also brought favorable results with an outpost well in Stafford County near the Hiss pool showing for a discovery and the fourth pool opener for the year officially completed in southwestern Cowley County.

The Cowley County completion was in Sinclair Prairie 1 Gibson, SE SE NW 29-34-3e, which was given a potential of 50 bbl. a day after a swabbing test. The well is north of the 600-acre Murphy pool and is producing from the Bartlesville sand, topped at 3,360 ft.

In northern Stafford County, Landon and Atlantic Refining Co. 1 Shaffer, W½ NW SW 3-21-13w, cored saturated Arbuckle dolomite from 3,536 ft. and was expected to make a well for another new pool. Operators ran 5½-in. casing for a test. The well is 3 miles southeast of the Hiss pool of southern Barton County.

## SUMMARY OF COMPLETIONS

| | No. | Bbl. | Footage |
|---|---|---|---|
| Oil wells: Bemis-Shutts | 1 | 3,000 | 3,574 |
| Barnholdt | 2 | 92 | 6,682 |
| Hall-Gurney | 5 | 10,603 | 13,227 |
| Stoltenberg | 1 | 94 | 3,308 |
| Trapp | 1 | 1,858 | 3,328 |
| Zenith | 5 | 11,850 | 18,927 |
| Other fields | 10 | 21,151 | 33,085 |
| Dry holes: Fields | 3 | ..... | 10,477 |
| Wildcats | 3 | ..... | 7,031 |
| Total | 31 | ..... | 99,639 |

*Wildcats.*—New operations reported during the week were up slightly to 49, but few were listed as wildcats. Among the test wells drawing attention, however, was Earl Wakefield 1 George Smyers, N½ NE SE 35-19-6w, in southeastern Rice County, 3 miles northwest of the Bornholdt pool. It is 1½ miles east of the R. E. Youker 1 Deeds-Day, an old test which had a showing in the chat and some indication of oil in the Simpson sand series.

Also listed as wildcats were Sherman, Smith et al 1 Benso, W½ SW 23-14-15w, an outpost east of the Niedenthal pool in Russell County, and Sharon Drilling 1-B Nevuns, SW SW NE 21-19-10w, northwest of the Silica pool in Rice County.

*Rooks County.*—Major operations of both Kansas and Oklahoma were particularly interested in a new start in Rooks County, Ruso Drilling 1 Bird, SE NW NW 21-10-19w, 2 miles from the Zurich pool, as virtually every active firm in the two states holds protection around the Ruso block. The well will be an Arbuckle lime test to approximately 3,700 ft.

### Nebraska Play Starts

The big play of the region, however, had swung to the extreme northwestern part of the state and over into southwestern Nebraska where leasing and preliminary exploration has been under way on a big scale all fall. Drilling has already started in the new areas and scouts were being moved in last week to cover developments.

The first test, Barnsdall and Helmerich & Payne 1 Erickson, SW SW SW 8-1n-23w, in Furnas County, Nebraska, was a failure at week's end, but apparently had little effect on general plans for testing other sectors. The Barnsdall test had granite at 3,498 ft. and was being abandoned.

Meantime, Ohio 1 G. C. Battin, N½ SE NW 15-2n-18w, in Harlan County near the north city limits of the town of Alma, was started. This test is to be drilled to the Arbuckle. Considerable gas has been found in water wells drilled in the past near the Ohio test, and some of these wells have had oil fillment on top of the water.

Both Harlan and Furnas counties lie on the north flank area of the Salina basin, a twin of the Forest City basin to the east which gave Nebraska its first commercial oil.

### KANSAS COMPLETIONS

**Barton County**

Beaver pool: Phillips 3 Weber, S½ SE NW 13-16-12w, dry, T.D. 3,398 ft.

Breford pool: Transwestern 5 Meyers, W½ NE NE 13-17-10w, 3,000 bbl., Arbuckle, acid, T.D. 3,241 ft. Carter 2 Burmeister, W½ SW NW 2-17-11w, 391 bbl., T.D. 3,355 ft.

Marchand pool: Continental 3 Scheuffler, N½ N½ NW 24-20-12w, 3,000 bbl., Arbuckle, T.D. 3,340 ft.

Prusa pool: Sinclair Prairie 3 J. Prusa, NW NW NE 29-15-11w, 2,953 bbl., Lansing-Kansas City lime, acid, T.D. 3,287 ft.

Trapp pool: Shell A-7 Batt, NW NW SE 35-15-14w, 1,858 bbl., Arbuckle, acid, T.D. 3,328 ft.

**Cowley County**

Couch pool: Ryan Consolidated 4 Hunsacker, SE NW NE 13-30-5e, 46 bbl., Burbank sand, T.D. 2,840½ ft.

**Ellis County**

Bemis-Shutts pool: Deep Rock 31 Baumer, E½ NE SW 27-11-17w, 3,000 bbl., T.D. 3,574 ft.

Hartsook pool: Gulf 1 J. M. Rome, W½ SW SW 19-13-16w, dry, T.D. 3,539 ft.

**Ellsworth County**

Stoltenberg pool: Shell 2 J. D. Stevenson, E½ SE SW 35-16-10w, 94 bbl., Arbuckle, T.D. 3,308 ft.

Wilkins pool: Hollow Drilling 4 Wilkins, N½ SE SW 18-17-9w, 3,000 bbl., Arbuckle, T.D. 3,256 ft.

**Franklin County**

Wildcat: Shults et al 1 Davis, S½ SW NW 28-18-18e, dry, T.D. 1,260 ft., Burgess sand 1,258 ft.

**McPherson County**

Bornholdt pool: Transwestern 4 Peterson, W½ SE NE 18-20-5w, 47 bbl., Mississippian chat, T.D. 3,346 ft.

**Phillips County**

Ray pool: Cetal 1 Hixenbaugh, SE NE NE 1-6-21w, dry, T.D. 3,540 ft., Granite wash.

**Rice County**

Bornholdt pool: Central Petroleum 1 Wright, E½ SE SE 13-20-6w, 45 bbl., Mississippian chat, T.D. 3,336 ft.

Bloomer pool: Gulf 6 Ames, SE NW NW 6-18-10w, 3,000 bbl., acid, Arbuckle, T.D. 3,241 ft.

**Rooks County**

Laton pool: Broadview Drilling C-2 Livingood, W½ SW NE 11-9-16w, 2,162 bbl., Lansing-Kansas City, T.D. 3,258 ft.

Dopita pool: Nill 1 Dopita, NW SW 31-8-17w, 599 bbl., T.D. 3,429 ft.

**Russell County**

Hall-Gurney pool: Coralena 4 Phinney, S½ SW NE 30-14-13w, 29 bbl., Lansing, T.D. 2,957 ft.

National Refining 2 Hall, NE SE SE 15-14-14w, 2,819 bbl., acid, Lansing.

Helmerich & Payne et al 6 Boxberger, W½ W½ NE 21-14-14w, 1,847 bbl., T.D. 3,116 ft.

Hartman & Blair 4 Boxberger, SE SW NE 26-14-14w, 3,008 bbl., T.D. 3,023 ft.

Hartman & Blair 4 Boxberger, SE SW NE 26-14-14w, 3,008 bbl., T.D. 3,023 ft.

Texon 6 R. S. Hall, S½ S½ SE 26-14-13w, 410 bbl., T.D. 2,900 ft.

**Stafford County**

Stafford pool: Stanolind 3 Charles, S½ NE SE 15-24-12w, 3,000 bbl., Viola, acid, T.D. 3,838 ft.

Zenith pool: Porter et al 1 Richardson, E½ SE SE 10-24-11w, 586 bbl., Misener, T.D. 3,828 ft.

Stanolind 1 Kirkpatrick, E½ NE NW 15-24-11w, 3,000 bbl., acid, Misener, T.D. 3,827 ft.

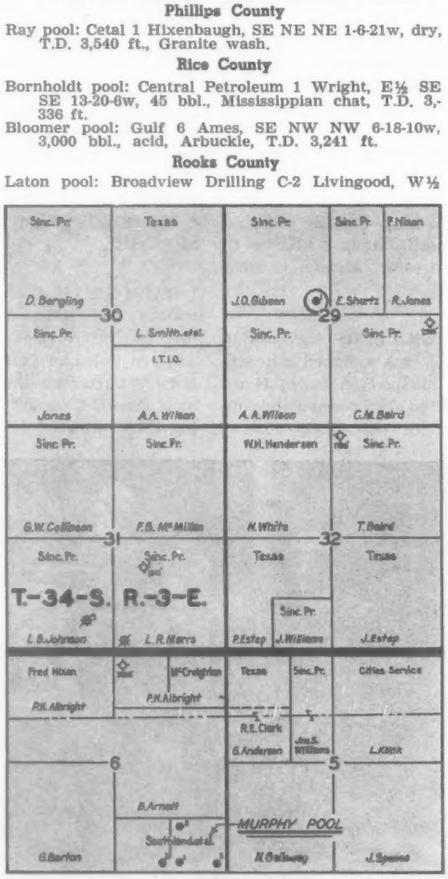
Stanolind 4 Richardson, S½ S½ NW 10-24-11w, 2,264 bbl., T.D. 3,792 ft.

Magnolia 3 Tretbar, S½ NE SE 12-24-11w, 3,000 bbl., T.D. 3,727 ft.

E. H. Moore 8 Steward, N½ NW SE 12-24-11w, 3,000 bbl., T.D. 3,753 ft.

Wildcats: Fain Drilling 1 Thole, E½ SE SE 23-21-12w, dry, T.D. 3,680 ft., Arbuckle 3,595 ft., some show oil.

Earl Wakefield and Atlantic 1 Prescott, W½ NW SW 32-23-14w, dry, T.D. 2,091 ft., Arbuckle 4,081 ft., no show.




Midcontinent Map Co., Tulsa

*Opening another new pool for Kansas is Sinclair Prairie 1 Gibson, SE SE NW 29-34-3e, north of the Murphy pool in Cowley County. The well, circled on the map, was being completed officially this week*

## AVERAGE DAILY PRODUCTION

### LEADING KANSAS FIELDS

| | Week ending Feb. 22 |
|---|---|
| Augusta | 1,250 |
| Bemis-Shutts | 8,100 |
| Bloomer | 5,500 |
| Burnett | 6,200 |
| Burrton | 7,700 |
| Chase | 5,200 |
| Elbing | 1,200 |
| El Dorado-Towanda | 7,250 |
| Geneseo | 4,250 |
| Graber | 2,450 |
| Greenwood County | 8,550 |
| Hollow-Nikkel | 1,450 |
| Keesling | 750 |
| Lerado | 500 |
| Lorraine | 1,400 |
| Oxford | 700 |
| Rainbow Bend | 950 |
| Raymond | 1,350 |
| Ritz-Canton | 3,850 |
| Trapp | 16,800 |
| Balance Russell County | 21,750 |
| Sedgwick County | 3,150 |
| Voshell | 1,750 |
| Silica | 19,300 |
| Wellington | 1,050 |
| Wherry | 4,250 |
| Zenith | 7,100 |
| Others | 63,350 |
| Total | 207,100 |

### KANSAS DRILLING REPORT

**Barton County**

Isern Brothers 1 Lillard ..... W½ SW SE 6-16-11w Some show oil 3,274-78 ft., no fill up, acid, 700 ft. fluid in hole, two-thirds water.

Republic Nat. Gas 1 Radenberg . . W½ NW SE 8-17-11w 8⅝-in. casing 240 ft.

Helmerich & Payne 1 Wondra . . SW SE NW 10-17-12w First report.

**Cowley County**

Sinclair Prairie 1 Gibson . . . . . SE SE NW 29-34-3e T.D. 3,378 ft., 1,000 ft. oil in hole, shot 3,367-76 ft., swabbed 30 bbl. in 24 hr. gravity 35.

**Elk County**

McPherson et al 1 Clogson ..... SW SE SE 21-28-11e Drilling 200 ft.

McPherson et al 1 Batesman .... SW SE NW 24-28-11e T.D. 250 ft.

**Ellsworth County**

Pryor & Lockhart 1 Weisenthal . SW SE NE 30-15-10w Howard 2,430 ft., 8-in. casing 2,684 ft., underreaming 8-in. at 2,810 ft.

**Graham County**

Ewers-Simpson 1 Bundy ..... SW SW 12-9-22w T.D. 3,899 ft., swabbed 110 bbl. water and 43 bbl. oil off bottom, 1,300 ft. fluid in hole in 12 hr., 50 per cent water, gravity 18.6, cored 3,879-87½ ft., fair saturation, swabbed 45 bbl. fluid an hr. for 3 hr., 4½ bbl. oil, S.D.

Gulf 1 Boller ..... E½ SE SE 29-7-22w T.D. 3,858 ft., acid, no test, at 3,890 ft., 2,800 ft. water in hole.

**Jefferson County**

McCain & Sherrod 1 Green ..... SW SW NW 9-11-19e Drilling 1,480 ft., 6-in. casing 1,388 ft.

**McPherson County**

Westgate-Greenland 1 Bukey ... S½ SE NW 17-18-1w Drilling 1,920 ft.

**Marion County**

Rex & Morris 1 Kappan .... N½ NW NE 16-18-4e 15-in. 100 ft., drilling ahead.

**Nemaha County**

Bumpus & Hibbard 1 Achten .... S½ SE NW 12-4-14e Mississippi lime 2,070 ft., S.D. 2,077 ft.

**Pratt County**

Stanolind 1 Hartsell ..... E½ NW NE 3-26-12w Drilling 3,020 ft.

Stanolind 1 Nagel ..... E½ NE SW 3-24-15w First report.

**Reno County**

Bay 1 Woodson ..... E½ NE NW 28-26-9w Anhydrite 510 ft., drilling 2,238 ft.

Hess & Son 1 McKee ..... E½ NE SE 8-22-8w Some show oil 2,470-80 ft., Topeka 2,490 ft., water 2,535 ft., S.D. 2,540 ft.

**Rice County**

Sharon Drlg. 1 Nevious ..... SW SW NE 21-19-10w Anhydrite 435 ft., Fort Riley 1,482 ft., drilling 2,470 ft.

Earl Wakefield 1 Symres ..... N½ NE SE 35-19-6w First report.

**Russell County**

Central Petroleum 1 Zeman .... SW SW NE 16-15-12w 15½-in. casing 380 ft., 12½-in. casing 550 ft., drilling 845 ft.

Earl Wakefield 1 Holland.....E½ NE SE 30-13-13w 8-in. casing 2,511 ft., Topeka 2,713 ft., 6-in. casing 2,830 ft., Dodge 2,60 ft., Lansing 3,000 ft., drilling ahead.

Shell 1 Ruby ..... NW NW NE 36-14-13w Topeka 2,505 ft., Lansing 2,815 ft., cored 2,836-44 ft., no show, cored 2,853-63 ft., fair porosity and oil stain, Sooy 3,106 ft., Arbuckle 3,120 ft., cored 3,123-28 ft., porous and some bleeding oil, T.D. 3,291 ft., 4-in. casing 2,932 ft.

**Stafford County**

Landon & Faulkner 1 Shaeffer W½ NW SW 3-21-13w Lansing 3,279 ft., some show oil 3,308-11 ft., 3,320-23 ft., 3,346-52 ft., oil stain 3,364-69 ft., show oil 3,404-07 ft., cored porous oolitic limestone, some show oil, 3,407-21 ft., some show oil 3,426-30 ft., 3,442-47 ft., conglomerate 3,504 ft., Simpson 3,510 ft., Arbuckle 3,536 ft., show oil 3,536-39 ft., cored dolomite with good saturation 3,539-42 ft., 5-in. casing 3,536 ft.

**Sumner County**

Benedum-Trees 1 Landwehr ..... E½ SE SE 17-32-1e Stalnaker 2,668 ft., cored shale and Stalnaker 2,660-78 ft., cored 2,678-96 ft., no show, Lansing 2,995 ft., fishing 3,370 ft.

**Thomas County**

Alva Billings 1 Ryan ..... E½ NE SE 27-8s-32w T.D. 3,817 ft., 6-in. casing 3,811 ft.

## FOREST CITY BASIN

ST. JOSEPH, Mo., Feb. 24.—Wells Nos. 34 and 35 were about to be added to the Richardson County, Nebraska, total as the third week of February closed. In the Falls City pool, Ohio Oil Co. cemented pipe for a test of 1 Bahr, SE NE 18-1n-16e, north offset to the Pioneer Drilling Co. 1 Boice. Showings indicated the well would produce, although the well ran a little lower than the offset and indicated that the north boundary of the pool had just been reached. Hunton lime was found at 2,277 ft.

In the Shubert vicinity, northern Richardson County, the Indian Territory Illuminating Oil Co. apparently was about to open up a long-awaited extension to the Shubert pool, which has been represented by a lone well, the same company's 1 Schaible-Nuttler. The new well 1 Schaible, C SW SW 29-3n-16e, went into Hunton lime at 2,462 ft. Free oil showed when the plug was drilled and acidization was scheduled. No. 1 Schaible is a southwest offset to the producer. A north offset, drilled by another operator, was a dry hole.

Ohio Oil Co. has been adding a new well lately about once a week. Latest to be staked was 2 Royal Boice, SE NE 18-1n-16e, south offset to the discovery, 1 Boice. Cellar and pits were dug at the close of the week. All contracts are going to the General Geophysical Co.

Not much else of importance took place in recent days. Operators are waiting for spring and firmer roads. Northeast Kansas was quiet, generally, and North Missouri had little to offer to scouts. The only active well at the moment in the deep part of Northwest Missouri was a Hunton lime failure. That was the Jackson & Rust 1 Hays, 3 miles northwest of Watson in C NE NE 22-66n-42w, Atchison County. The wildcat found Hunton at 2,092 ft., cored from 2,154-72 ft. and was shut down for orders at 2,192 ft. There were no shows.

### FOREST CITY DRILLING REPORT

**NEBRASKA**

**Richardson County**

Ohio 1 Bahr .....SE SW SE 7-1n-16e Hunton 2,277 ft., waiting on cement.

Ohio 2 Royal Boice .....SE NE 18-1n-16e First report.

J. E. Palensky 1 Kalous ..... SW SW 5-2n-13e Tight hole, Hunton 1,571 ft., water when drilled plug, to recement.

**MISSOURI**

**Atchison County**

Jackson & Rust 1 Hays C NE NE 22-66n-42w Hunton 2,092 ft., total depth 2,192 ft., no shows; S.D.

**IOWA**

**Taylor County**

W. O. Smythe 1 Hook ..... C NE NW 18-69n-35w 8-in. to 1,250 ft., drilling at 1,475 ft.

**KANSAS**

**Jefferson County**

G. A. Caufield et al 1 Ragan SW SE 19-10s-20e 6-in. at 1,170 ft., drilling 1,290 ft.

**Leavenworth County**

McLaughlin & Sons 1 Thorp .. C NE NE 27-10s-20e 5-in. casing on wall packer at 2,165 ft.

## Texas Gulf Coast

*(Continued from Page 109)*

**Jackson County**

Norsworthy Prod. Co. 1 C. F. Combs, Section 32, Morris & Cummings Sur., drilling shale 2,790 ft.

**Matagorda County**

Stanolind 1 L. F. Huebner, 2 miles west of Hamman field, E. Hall Sur., drilling shale 8,150 ft.

**Waller County**

John Mayo et al 1 P. H. Donnigan, Wilcox test, east flank Brookshire dome, William Cooper Sur., top Cook Mountain 7,500 ft., drilling shale 7,705 ft.

## Western Kentucky

*(Continued from Page 108)*

heirs, 15 bbl., 40-qt. shot, Jones sand 368-405 ft., T.D. 410 ft.

**Daviess County**

Utica district: Schaffer et al 3 Millie Neeley, dry, T.D. 1,724 ft.

**Muhlenberg County**

Bremen district: Peerless Oil Co. 1 Elmer Noftsinger, dry through McClosky, T.D. 2,421 ft.

**Ohio County**

Fordsville district: J. C. Miller, trustee, 21 Ed Smith, 10 bbl., 50-qt. shot, Jett sand 274-94 ft., T.D. 321 ft.

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# Hawkins Field Is Limited on West by Supposed Producer

By R. MARNE SANFORD

DALLAS, Tex., Feb. 24.—The Hawkins field of Wood County received another defining failure the past week as a previously supposed producing well was declared dry in the Woodbine sand and rigged up for deepening to the Paluxy level. General activity for the Hawkins field is now limited to the three active tests by Humble Oil & Refining Co. in the northern part of the field, there being no active tests in the Hawkins townsite since the completion this week of the E. B. Germany 1 Menshew.

**SUMMARY OF COMPLETIONS**

*East Central Texas*

| | No. | Bbl. | Footage |
|---|---|---|---|
| Oil: Van field | 1 | 526 | 2,858 |
| Dry: Fields | 1 | ..... | 4,375 |
| Wildcats | 3 | ..... | 14,070 |
| Total | 5 | ..... | ..... |

Activity for the East Central Texas district as a whole was pushing ahead with the starting of many previously reported wildcats and the staking of a few new deep wildcats.

The defining outpost west of Hawkins is the A. A. Folsom 1 Prince, Wideman Survey, which last week indicated a commercial producer and an extension for the field. During the early part of the week just past the operator attempted three times to obtain a successful drill-stem test of slight saturation in the upper part of the Woodbine section from 4,694 to 4,707 ft., however, each showed little promising results. With a total depth of 4,866 ft. the test has been turned to the drilling contractor, Red Iron Drilling Co., who will carry it ahead in search of production in the Paluxy sand. The main oil-bearing portion of the Woodbine sand found in the Hawkins townsite was reported to have graded into shale in 1 Prince.

The latest completion for the Hawkins townsite is the E. B. Germany 1 Menshew, a 1,000-ft. extension which has been gaged at 18 bbl. hourly for a full 24-hour official flow. The oil was 27 gravity, slightly higher than in the last townsite completion, however, slightly lower than the original townsite discovery. With the completion of this test attention in the field shifted to Humble's three tests in the north part of the field, all nearing the Woodbine section.

A new drilling program was indicated for the townsite, however, when General American Oil Co. received permits for three tests, all of which will be started in the near future. The first is to be 1-A Kay, 70 ft. from the east and west and 12 ft. from the north and south lines of Lot 18, Block 21, Brewer Survey, in the townsite. The 1-B Kay is located in Lot 10, same block and survey, while 1 Holmes is spotted in the center of Lot 6, Block 22, Brewer Survey. Contracts have been let and materials are being moved in.

### New Wildcats

The Ore City area of Upshur County centered new attention as permits were filed for five new townsite tests, all exceptions to the general spacing rule. They were filed as protective measures should Sun Oil Co. find production at its 1 Henderson, Asher Survey, deep wildcat now drilling at Ore City. It was last reported coring the Paluxy sand at 4,730 ft. New permits sought were one each by C. M. Edwards and J. G. Shaw for the First Baptist Church lands, one each by Edwards and Shaw for the Jim Ferguson tract, and one jointly by Edwards and Shaw for the Ferguson tract, all in the townsite of Ore City. Special hearing for granting of these permits is scheduled for Wednesday of this week.

A new deep projected wildcat has been staked in northwestern Smith County and south of Hawkins in Wood County by A. H. Beddinghaus and associates, Fort Worth. It is to be 1 J. A. McCreary, in the H. Huejas Survey, 6 miles southwest of Mount Enterprise. It is on a 265-acre tract and is contracted to 6,500 ft. Materials are being moved to location for immediate drilling.

In Robertson County, where one new wildcat test has been located within the past 10 days, another location was spotted the past week. It is C. C. Baker & Son 1 A. Middleton, J. S. McNeil Survey, 2 miles south of the town of Elliott. It has been spudded and shut down at 20 ft. The contract depth of this test was not announced.

Anderson County is scheduled for at least two new wildcats within the near future. Elbert Williams, Dallas, and Griffith Brothers, Fort Worth, are obligated to start a test soon on the Anderson Clayton Cotton Co.'s 57-acre tract, William Frost Survey, out of a 2,500-acre block recently acquired and carrying a drilling clause.

Southwest of Elkhart, in the same county, Guinn Lewis et al have completed a 3,000-acre block out of the John Box and R. W. Box surveys and have reportedly let contract for a test. Location was not announced, nor was the contract depth, however, the latter is expected to be the Woodbine sand.

### EAST CENTRAL TEXAS COMPLETIONS

**Bowie County**

Wildcat: A. L. Willis 1 Taylor, J. McClure Sur., ⅛ mi. NW Redwater, top Nacatoch 1,084 ft., Pecan Gap 1,639 ft., Blossom sand 2,490 ft., Georgetown lime 3,176 ft., Fredricksburg 3,398 ft., dry at 4,002 ft.

**Titus County**

Talco field: Magnolia 8 Chapman, dry at 4,375 ft.

**Trinity County**

Wildcat: R. W. Burnett 1 Southern Pine Lbr. Co., G. Ricardo Sur., top Wilcox 1,554 ft., dry at 2,567 ft.

**Van Zandt County**

Van field: P. Calvert 2 Carter, 67 bbl. in 3 hr., 2,842-58 ft.

**Wood County**

Wildcat: Delta Drilling Co. and Sells Pet. Co. 1 Beckham, G. W. Cowan Sur., 4½ mi. NE Mineola, top Pecan Gap 5,065 ft., top sand 6,620 ft., dry at T.D. 7,501 ft.

### EASTERN TEXAS WILDCAT REPORT

**Anderson County**

R. H. & W. Oil 1 Saunders, 17-acre tract in Joseph Ferguson Sur., in Frankston townsite, top sub-Clarksville 4,874-4,910 ft., fishing 5,225 ft.
Texas 1 Greenwood, M. Salisar Sur., 4 mi. NW Palestine, rigging up for new hole.

**Lamar County**

Whitehead & Dahl Bros. 1 J. M. Barr, P. Compton Sur., 9 mi. S. Paris.

**Leon County**

H. A. Lindsay 1 J. L. White, McKinney & Williams Sur., 1 mi. SE of Buffalo, 10¾ in. at 1,021 ft., T.D. 2,025 ft.

**McLennan County**

E. P. Campbell 1 Stewart, S. Burton Sur., 5 mi. N of Waco, S.D. 765 ft.
Frank Place 1 Hackney, I. Robbins Sur., 4 mi. SE McGregor, drilling 900 ft.

**Navarro County**

Hargrave Oil 1 C. S. West, M. Boren Sur., 1½ mi. S Richland, T.D. 3,257 ft., salt water.

**Robertson County**

C. C. Baker & Son 1 Middleton, J. S. McNeil Sur., 2 mi. S. Elliott, S.D. 20 ft.
H. A. Clary 1 A. G. Scott, H. F. Thornton Sur., 2 mi. W Franklin.

**Rusk County**

Delta Drilling Co. 1 Kangera, 113-acre tract in R. Lane Sur., 3 mi. N of Henderson, 8,200-ft. test, spudding.
Skelly Oil 1 Markey, Nolan Sur., 4 mi. SW Mount Enterprise, 8,000-ft. test, top Austin 3,352 ft., drilling 4,270 ft.

*(Continued on Page 119)*


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CLEVELANDS

By
STAFF CORRESPONDENT

# Several Trenton Tests Near Pay as Second Well Improves

MATTOON, Ill., Feb. 24.—Production at Magnolia's first Trenton producer in the Salem field, 32 Shanafelt, increased to more than 300 bbl. a day at the end of the week and operators were running tubing at a total depth of 4,609 ft. The well flowed throughout the time workmen were cleaning out the hole. The increased production strengthened the belief that the well will produce about 500 bbl. a day when completed. Magnolia 32 Shanafelt is an offset to the Trenton discovery well, Rossi 8 Brooks, which has now settled down to pumping at the rate of 190 bbl. a day.

The Texas Co. was cementing pipe to 4,550 ft. at 21 McCollum at the end of the week. This well is located in SE SE 29-2n-2e, and picked up the Trenton several feet lower than all other tests in this area, which encountered it at about 2,505-09 ft.

*Mount Carmel.*—Mount Carmel's first dry hole was completed last week. It was Hudson & Hess 1 Smith, Block 187, which found three prospective pays, the Biehl, Cypress, and McClosky, dry. Hall-Jordan have two wells near completion in Mount Carmel at the present time. Of these, 1 Brunner, Block 218, was being cleaned out after a light shot in the Cypress and was to be put on pump, while 1 Carson was still testing Biehl saturation at the end of the week. Hall-Jordan have one other operation in the city and were planning to make application for permits for five new tests in the north part of the city late last week. Twelve drilling permits have been issued in Mount Carmel to date.

## SUMMARY OF COMPLETIONS

| | No. | Bbl. | Footage |
|---|---|---|---|
| Oil wells: Belle Prairie | 1 | 215 | 3,466 |
| Benton | 1 | 373 | 2,152 |
| Clay City | 1 | 474 | 3,068 |
| East Calvin | 6 | 993 | 16,267 |
| Fairman | 1 | 200 | 1,436 |
| Griffin | 1 | 208 | 2,502 |
| Hoodville | 3 | 643 | 9,194 |
| Louden | 3 | 542 | 4,710 |
| Maud | 1 | 312 | 2,635 |
| Mount Carmel | 1 | 300 | 2,369 |
| West Enterprise | 1 | 431 | 3,090 |
| West Liberty | 2 | 430 | 5,587 |
| Other pools | 12 | 776 | 32,166 |
| Wildcats | 1 | 1 | 485 |
| Dry holes: Fields* | 4 | ..... | 10,348 |
| Wildcats | 13 | ..... | 26,741 |
| Total | 52 | ..... | 126,216 |
| Recompletions | 4 | 362 | ..... |

*Louden 1, Griffin 1, Enterprise 1, East Calvin 1.

## Hamilton County

Kingwood 1 Moore, a semiwildcat in the northern part of Hamilton County, pumped 215 bbl. of oil in 22 hours from a total depth of 3,412 ft. late last week. The well is located in S½ SE NW 2-4s-6e, about ½ mile east of a lone McClosky producer. Successful completion of 1 Moore will probably revive interest in the area which boomed and then lagged during the completion of Kingwood 1 Williams, the other producer there.

*Dahlgren pool.*—A prospective McClosky producer was near completion in the Dahlgren pool of Hamilton County at the end of the week. W. E. Witt 1 Cage, NE SE NE 34-4s-5e, was being cleaned out after the hole had filled with more than 1,000 ft. of oil. Witt's well is a south offset to Dick Duncan's discovery well, 1 Zellars, which was initialed at about 400 bbl.

Offsetting the discovery to the west, Hall-Jordan 1 Deerhake, SE NE NE 34-3s-5e, topped the McClosky at 3,329 ft., and recovered about 10 ft. of saturation at 3,333-43 ft. Casing was being set during the week end for a test.

A sizable extension of the new Benton pool of Franklin County was assured early last week when E. S. Adkins 1-B Orient, SE NE NW 12-7s-2e, a wildcat about 4 miles from other production, pumped 50 bbl. of oil and 50 bbl. of water in a 24-hour test. The well is bottomed in the Tar Springs.

Adkins' second producer in the Benton field, 2 Orient, SE SW SE 24-6s-2e, pumped 425 bbl. in 24 hours on initial-production test. This well is also producing from the Tar Springs as is the discovery well, Adkins 1 Orient.

### ILLINOIS COMPLETIONS

#### Clay County

Clay City pool: Pure 1 Mosley Cons., N½ SE SW 3-2n-8e, flowed 474 bbl., 5,000 gal. acid, Fredonia 2,975 ft., T.D. 3,068 ft.

#### Edwards County

Wildcat: H. C. Rife 1 Broster, SE SE 9-3s-14w, dry, T.D. 1,867 ft.

#### Fayette County

Louden pool: Carter 1 Guy Smith, NE SE NE 20-8n-3e, pumped 276 bbl., 10-qt. shot 1,580-83 ft., 40-qt. shot 1,498-1,511 ft., Cypress sand 1,491-1,522 ft., Paint Creek stray 1,577-86 ft.

Carter 1 Purtilar School, NW SW NW 24-8n-3e, pumped 54 bbl. oil and 55 bbl. water, 10-qt. shot 1,524-37 ft., Cypress sand 1,510-36 ft.

Minerva-Magnolia 1 Tish, NW SE SE 35-8n-3e pumped 212 bbl., 15-qt. shot 1,571-78 ft., 20-qt. shot 1,466-84 ft., Benoist 1,569-75 ft., T.D. 1,588 ft.

Carter 2 J. Lilly, NE SE SE 17-8n-3e, dry, Glen Dean 1,370 ft., Cypress 1,526 ft., Cypress sand 1,539-45 ft., Paint Creek 1,585-95 ft., T.D. 1,600 ft.

St. James pool: Zephyr 1 Owens, NW NE SE 31-6n-3e, pumped 65 bbl. oil and 5 bbl. water, 2½-qt. shot 1,629-31 ft., Cypress sand 1,625 ft., saturation 1,627 ft., T.D. 1,632 ft.

Wildcat: J. H. Foster 1 Goldner, SW SW SW 25-5n-4e, dry, Glen Dean 2,084 ft., Cypress sand 2,269-2,330 ft., Benoist 2,446 ft., Aux Vases 2,505 ft., Ste. Genevieve 2,558 ft., Rosiclare 2,576 ft., Fredonia 2,595 ft., McClosky 2,632-34 ft.

#### Franklin County

Benton pool: Adkins 2 Orient, SE SW SE 24-6s-2e, pumped 373 bbl., 30-qt. shot, Tar Springs sand 2,115 ft., T.D. 2,152 ft.

#### Hamilton County

Hoodville pool: Mammoth P. & R. 1 Jackson, SW SW SW NW 35-5s-6e, pumped and swabbed 250 bbl., 5-qt. shot 3,037-42 ft., Aux Vases 3,029 ft., deepened from 2,951-3,042 ft.

Howell et al 1 Campbell, SW NE NE 34-5s-6e, pumped 72 bbl., 20-qt. shot 3,070-75 ft., Aux Vases 3,063 ft., deepened from 2,975-3,075 ft.

Texas 8 Edwards, NW SW SW 35-5s-6e, pumped 88 bbl. in 18 hr., 50-qt. shot 3,052-55 ft., 14-qt. shot 2,939-46 ft., Benoist 2,928-49 ft., Aux Vases 3,044-49 ft., T.D. 3,055 ft.

Sparrow 1 L. York, SW NE NE 34-5s-6e, location abandoned.

Ohio 3 O. Matheny, SW NW SE 3-6s-6e, flowed 386 bbl., Benoist 2,968 ft., Aux Vases 3,065 ft., T.D. 3,088 ft.

Texas 6 Edwards, NE SE NE 3-6s-6e, pumped 169 bbl. in 14 hr., Benoist 2,936-44 ft., Aux Vases 3,030 ft., T.D. 3,051 ft.

Springerton pool: W. W. Gray 1 fee-B, NE NE NE 1-4s-7e, pumped 10 bbl. oil and 30 bbl. water, 30-qt. shot 3,245-75 ft., Aux Vases 3,224 ft., saturated sand 3,238-46 ft., 3,270-74 ft., T.D. 3,275 ft.

Belle Prairie pool: Holleman & Bruell 1 Moore, S½ SE NW 2-4s-6e, pumped 215 bbl., 500 gal. acid, perf. 3,400-06 ft., McClosky 3,403-10 ft., T.D. 3,466 ft.

#### Jackson County

Wildcat: W. R. White 1 Dean, NE NW NW 18-9s-3w, dry, Glen Dean 335 ft., Hardinsburg 355 ft., Golconda 382 ft., Cypress 525 ft., Cypress sand 695-710 ft., Benoist 745-63 ft., Renault 760 ft., Ste. Genevieve 910 ft., St. Louis 990 ft., Salem 1,045 ft., junked hole, T.D. 1,245 ft.

#### Jasper County

West Liberty pool: Pure 1 Rohr Consol., E½ SE NE 5-5n-10e, pumped 11 bbl. in 12 hr., perf. 2,688-2,720 ft., pay 2,785-87 ft., P.B. 2,747 ft.

Pure 1 J. C. Raef-A, W½ NW SE 32-6n-10e, flowed 419 bbl., 5,000 gal. acid, pay 2,758-68 ft., Fredonia 2,752 ft., T.D. 2,800 ft.

Wildcat: Jasper Oil 1 Poehler, N½ NE NW 7-5n-10e, dry, T.D. 2,882 ft., P.B. 2,825 ft.

#### Marion County

Fairman pool: Shell 9 Ververs, NE NE NW 18-3n-1e, pumped 200 bbl., pay 1,432-35 ft., Benoist 1,426 ft., T.D. 1,436 ft.

#### McDonough County

Wildcat: Ripley Dome Syndicate 1 T. A. Jeffries, NW NE SW 21-4n-4w, pumped ½ bbl., 100 lb. dynamite 470-80 ft., 500 gal. acid, T.D. 485 ft.

#### Montgomery County

Wildcat: Jack Casson et al 1 J. V. Boehler, SE NW NE 24-10n-5w, dry, T.D. 650 ft.

Schnider & Gwin 1 Englehoff, NE NE SW 19-10n-4w, dry, sand 621-23 ft., T.D. 662 ft.

A. M. Lacey 2 Luddeke, SE NW NW 28-9n-4w, dry, T.D. 1,801 ft.

Dortonedge 1 Ahrling, SE SE SE 13-10n-5w, dry, sand 630 ft., no show oil, T.D. 670 ft.

#### Richland County

Dundas pool: Pure 2 Kermicle, E½ SW SE 31-5n-10e pumped 41 bbl., 5,000 gal. acid, pay 2,816-20 ft., Fredonia 2,807 ft., T.D. 2,853 ft.

North Noble pool: Oilwell Drlg. 1 F. Hilborn, NW SW NE 24-4n-9e, pumped 10 bbl. oil and 1 bbl. water, 30-qt. shot 2,586-98 ft., Cypress sand 2,582 ft., T.D. 2,601 ft.

Pure 2 Blain Consol., NW SE SW 24-4n-9e, pumped 10 bbl. oil and 6 bbl. water, 30-qt. shot 2,594-2,601 ft., Cypress sand 2,578 ft., saturated stray 2,599-61 ft., T.D. 2,601 ft.

Wildcat: R. Johnson 1 E. Richart, N½ NE SE 12-2n-9e, dry, T.D. 3,180 ft.

#### Shelby County

Wildcat: B. F. Gloyd et al 1 Eddy, NW NW NW 8-10n-3e, location abandoned.

#### Wabash County

Maud pool: Continental 3 Seiler, SE SW NE 34-1s-13w, pumped 312 bbl., 4,000 gal. acid, perf. 2,598-2,605 ft., 2,617-21 ft., Waltersburg sand 1,930-47 ft. (saturated), McClosky 2,599-2,601 ft., 2,617-20 ft., 2,629-35 ft.

South Griffin pool: Longhorn 7 Helm, SE NE NE 27-3s-14w, pumped 100 bbl., 4,000 gal. acid, McClosky 2,893-2,901 ft.

Griffin pool: Phillips 13 Schultz, NW NW SW 7-3s-13w, dry, base Pennsylvanian 1,738 ft., Menard 1,960 ft., Waltersburg 2,039-82 ft., Tar Springs 2,118 ft., Glen Dean 2,256 ft., Golconda 2,335 ft., Barlow 2,451 ft., Cypress sand 2,496-2,520 ft., T.D. 2,529 ft.

Phillips 12 Schultz, SE NE SE 12-3s-14w, pumped 208 bbl., 40-qt. shot 4,486-2,502 ft., Cypress sand 2,480 ft., T.D. 2,502 ft.

Wildcat: N. V. Duncan 1 O. A. Price, NE SE NW 19-1n-12w, dry, Waltersburg 1,616-1,706 ft., Tar Springs 1,744 ft., Glen Dean 1,834 ft., Hardinsburg 1,891 ft., Golconda 1,945 ft., Barlow 2,050-60 ft., Cypress sand 2,060 ft., Paint Creek 2,180 ft., Benoist 2,208 ft., Renault 2,288 ft., Ste. Genevieve 2,354 ft., McClosky 2,422-30 ft., T.D. 2,470 ft.

Hudson-Hess 1 Clint Smith, W½ W½ NW 20-1s-12w, dry, Glen Dean 1,827 ft., Cypress sand 2,050 ft., Benoist sand 2,213-27 ft., Aux Vases sand 2,270 ft., McClosky 2,379-82 ft., T.D. 2,425 ft.

Mount Carmel pool: O'Meara 2 E. J. Harris, SW NW SE 17-1s-12w, pumped 300 bbl., McClosky 2,354-64 ft., 2,366-69 ft., T.D. 2,369 ft.

#### Washington County

McKinley pool: McBride 3 Freeman, NE SE NW 29-3s-4w, pumped 40 bbl. oil and 3 bbl. water, Benoist sand 981 ft., T.D. 1,019 ft.

Wildcat: T. Collins et al 1 Hood, NW SW NW 28-3s-4w, location abandoned.

#### Wayne County

West Enterprise pool: Pure 1 R. Benskin-A, W½ NW NE 1-1n-7e, pumped 431 bbl., 5,000 gal. acid, pay 2,991-94 ft., Rosiclare 2,989 ft., T.D. 3,090 ft.

Enterprise pool: Pure 2 Trotter, W½ NE SW 5-1n-8e, dry, Glen Dean 2,492 ft., Hardinsburg 2,500 ft., base Golconda 2,650 ft., Cypress 2,665 ft., Cypress sand 2,678 ft., no show oil, Aux Vases 2,946-52 ft., show oil, Ste. Genevieve 2,992 ft., Rosiclaire 3,013 ft., Fredonia 3,039 ft., pay 3,041-43 ft., show oil 3,094-96 ft., 3,104-08 ft., T.D. 3,110 ft., P.B. 2,960 ft.

Pure 1 L. McConnell, E½ NW NW 32-2n-8e, pumped 13 bbl. oil and 58 bbl. water, 5,000 gal. acid, pay 3,032-66 ft., Fredonia 3,002 ft., T.D. 3,075 ft.

Aden pool: Texas 1 G. Stone, SE SE SW 9-3s-7e, pumped 40 bbl. in 11½ hr., 2,000 gal. acid, McClosky 3,339-41 ft., saturation 3,336-38 ft., T.D. 3,344 ft.

#### White County

East Calvin pool: W. W. Gray 3-H fee, SW NE NE 20-4s-14w, flowed 130 bbl., Renault 2,759 ft., Aux Vases 2,827-50 ft., T.D. 2,857 ft.

Skelly 1 Daley Trustee-B, NE NE NW 20-4s-14w, pumped 81 bbl. oil and 80 bbl. water, Tar Springs 2,292 ft., T.D. 2,306 ft.

Pure 3 G. P. Calvin-A, NW SE NW 9-4s-14w, flowed 192 bbl., 60-qt. shot 2,825-48 ft., 40-qt. shot 2,706-21 ft., Paint Creek 2,623-45 ft., 2,698-2,722 ft., Aux Vases 2,822-36 ft., T.D. 2,848 ft.

Delta Drlg. 2 Boltinghouse, SW NE NW 16-4s-14w, flowed 300 bbl., 40-qt. shot on bottom, Aux Vases 2,824 ft., T.D. 2,842 ft.

Pruett 2 Boltinghouse, SE SE NE 17-4s-14w, pumped 90 bbl., 20-qt. shot 2,574-84 ft., Cypress sand 2,568-84 ft., T.D. 2,584 ft.

Herndon Drlg. 4 Bond, NE NE NE 8-4s-14w, pumped 40 bbl., 40-qt. shot 2,805-15 ft., old well P.B. from 2,947-2,815 ft.

Buell & Herndon 4 J. J. Bond, NE NE NE 8-4s-14w, flowed 200 bbl., 80-qt. shot 2,804-24 ft., Aux Vases sand 2,759-83 ft., 2,802-24 ft., T.D. 2,830 ft.

Bell Bros. 2 Morris, SW NW NW 21-5s-14w, dry, Glen Dean 2,474 ft., Hardinsburg 2,533-42 ft., Golconda 2,577 ft., Barlow 2,702 ft., Cypress sand 2,745-56 ft., show oil and water, Benoist 2,896 ft., Renault 2,486 ft., Aux Vases 3,007 ft., Ste. Genevieve 3,022 ft., McClosky 3,076-80 ft., show oil and water, T.D. 3,109 ft.

North New Harmony pool: Sun 13 E. R. Greathouse, SW NE SW 33-4s-14w, location abandoned.

Centerville pool: Anderson et al 1 C. Brown, SW NE NE 2-4s-9e, pumped 91 bbl., 1,000 gal. acid, Mc-

Closky 3,363-69 ft., perf. 3,393-97 ft., 3,395-99 ft., T.D. 3,453 ft.

West Irons pool: Exchange 1 M. A. Johnson, SE SE NW 26-6s-8e, flowed 131 bbl., 1,000 gal. acid, 2,000 gal. reacid, perf. 2,998-3,004 ft., 3,012-18 ft., McClosky 2,993-95 ft., 3,000-02 ft., 3,014-17 ft., 3,045-54 ft., T.D. 3,126 ft.

Storms pool: Smokey 1 Wilson, SW SW NE 11-6s-9e, pumped 225 bbl., 30-qt. shot 2,275-82 ft., Waltersburg 2,271 ft., T.D. 2,286 ft.

Wildcat: Ryan Oil 1 Keck, NE NW SE 36-6s-10e, dry, Palestine 1,955 ft., Palestine sand 1,965 ft., Tar Springs 2,228 ft., Golconda 2,403 ft., Barlow 2,554 ft., Cypress sand 2,706 ft., Benoist 2,728 ft., Renault 2,782 ft., Aux Vases 2,828 ft., Ste. Genevieve 2,870 ft., T.D. 3,010 ft.

Carl Robinson 1 Metcalf, SE NE SE 31-3s-11e, dry, T.D. 3,092 ft.

R Halbert 1 Hubble, NE NW SW 7-6s-11e, dry, Glen Dean 2,312 ft., Hardinsburg 2,363 ft., sand 2,409 ft., Barlow 2,562 ft., Cypress sand 2,587 ft., Benoist 2,728 ft., Renault 2,792 ft., Aux Vases 2,859 ft., St. Louis 3,030 ft., T.D. 3,035 ft.

## ILLINOIS DRILLING REPORT

### Bond County

Thomas Scharf et al 1 Calufetti SE SW NE 27-7n-4w
Drilling 110 ft.

Haines & Jackson 1 Hunter . . . . . SW SE SE 1-4n-4w
Drilling 1,501 ft. in sand.

Woodruff 1 Harwood . . . . . NE NE SE 36-7n-4w
S.D. 535 ft.

### Bureau County

F. E. Webb 2 Abrahams . . . . . NE NE NE 24-18n-8e
S.D. 420 ft.

### Clark County

Sherritt et al 1 Jeffers . . . . . SE NE SE 31-11n-13w
S.D. 1,465 ft.

Neal Stewart 1 Wallis . . . . . NW SW SE 8-10n-14w
Set 8-in. 125 ft., drilling 125 ft.

### Clinton County

Hughes 2 Holman . . . . . NE SW SE 10-2n-1w
Underreaming 8-in. 1,015 ft.

### Edwards County

Roy Powers et al 1 Strauss . . . . E½ SE SW 4-1s-14w
Rigging up rotary tools.

Seaboard 1 Gragham . . . . . SE SE SW 3-1n-14w
Spud.

Noah & Morrison 1 Smith . . . . . NE SW SE 12-2s-10e
Rig.

### Fayette County

Turner Drlg. 1 Williams . . . . . SW SW NW 6-6n-2e
T.D. 200 ft., junked hole, to skid rig 5 ft. south.

Allied Oil & Youngblood 1 Bonnell NE NW NE 15-4n-1w
Base Pennsylvanian 1,066 ft., Glen Dean 1,126 ft., Hardinsburg 1,152 ft., Golconda 1,175 ft., Barlow 1,278 ft., Cypress 1,279 ft., Paint Sreek 1,352 ft., Benoist 1,422 ft., Ste. Genevieve 1,575 ft., cored 1,428-35 ft., no shows, drilling 1,702 ft.

### Ford County

Nelson et al 1 Erp . . . . . SW NW SE 19-24n-7e
Drilling 2,560 ft.

### Franklin County

E. S. Adkins 1-B Orient Coal . . . . SE NE NW 12-7s-2e
Pumped 50 bbl. oil and 67 bbl. water in 23 hr., testing.

### Fulton County

Lee Township Oil 1 Quigle . . . . . SE SW NE 14-7n-1e
Drilling 160 ft.

### Gallatin County

W. E. Allund 1 E. Frey . . . . . NE SE NW 19-8s-10e
T.D. 1,848 ft., P.B. 1,795 ft., 40-qt. shot 1,783-94 ft., cleaning out.

Sun 1 C. W. Patton . . . . . NW NE NE 4-8s-8e
Set 8⅝-in. 144 ft., show oil 342-80 ft., saturated sand 385-400 ft., base Pennsylvanian 1,421 ft., Kincaid 1,553 ft., drilling 1,580 ft.

Seaboard 1 Colnon . . . . . NW NW SE 4-8s-8e
Set 10-in. 106 ft., Pennsylvanian sand 542 ft., show oil, coring 545 ft.

### Greene County

Scroggins 1 McVay . . . . . SW NE 4-10n-11w
S.D. 595 ft.

### Jackson County

Barton & Shipman 1 P. Maharry . . NE NE SE 20-9s-3w
Drilling 900 ft.

### Johnson County

Benedum-Trees 1 Cavitt . . . . . SW SW NW 24-11s-3e
Osage 2,870 ft., drilling 3,555 ft.

### Lawrence County

W. Payne 1 H. Payne . . . . . NW SW NW 20-3n-11w
Drilling 1,115 ft.

### Macoupin County

Bridges & Valbert 1 Feiker . . . . NW NE SW 1-9n-7w
Water 1,145-55 ft., drilling 1,160 ft.

### Madison County

Alch & Carroll 1 Rinkel . . . . . SE NE NW 33-5n-6w
Drilling 830 ft.

E. A. Gilchrist 1 E. Hasto . . . . . NW NW SW 5-5n-5w
S.D. 810 ft.

### Marion County

J. Dunbar 1 Fischner . . . . . SW SW 27-3n-1e
Drilling 260 ft.

### McLean County

Funks Grove O. & G. 1 Crawford NW NW NW 28-22n-1e
T.D. 1,920 ft., running 8-in.

### Montgomery County

H. C. Detrick 1 W. H. Barnes . . NW NE SE 20-10n-2w
S.D. 1,184 ft.

### Morgan County

Measely et al 1 Thompson . . . . NW NE NW 1-16n-11w
S.D. 810 ft.

C. L. Hunt 2 Cuddy . . . . . NE NW NW 2-13n-10w
S.D. 1,409 ft.

### Randolph County

J. R. Rankin 1 B. Bierman . . . . . SW SW SE 3-7s-5w
S.D. 590 ft.

### Richland County

Oilwell Drlg. 1 B. W. Blain . . . . . SE NW SW 24-4n-9e
Glen Dean 2,373 ft., base Golconda 2,540 ft., Cypress 2,552 ft., stray 2,552-62 ft., show oil, Cypress sand 2,584 ft., T.D. 2,598 ft., 21?qt. shot 2,588-98 ft., swedging casing.

C. B. Hill 1 Wood . . . . . NE SE SE 21-2n-14w
Renault 2,915 ft., S.D. 3,100 ft.

### Saline County

Diggs, trustee, 1 Loomis Hardesty . . . . . W½ NE SW 20-7s-5e
Set 8⅝-in. 65 ft., S.D. 400 ft.

Williams 1 A. Smith . . . . . SE SW SW 2-10s-6e
Drilling 1,670 ft.

### Shelby County

J. Moore et al 1 fee . . . . . SW SW NE 30-10n-3e
Cypress sand 1,620 ft., Benoist 1,745 ft., S.D. 1,760 ft.

### Tazewell County

Bartelmay 1 Mathis . . . . . SW NW SW 24-25n-3w
Burlington 800 ft., T.D. 805 ft., running casing.

### Wabash County

E. O. Olds et al 1 Parkinson NE NE SE NW 29-1s-12w
Set 10-in. 55 ft., waiting on cement.

Hayes & Yingling 1 Tanquary . . NE SE SE 26-1s-14w
Providence 765 ft., Palestine 2,016 ft., Menard 2,075 ft., drilling 2,260 ft.

### Washington County

R. P. Lester 1 Torren . . . . . SW SE SW 21-3s-4w
Drilling 355 ft.

### Wayne County

Carl Robinson 1 C. K. Bathwell . W½ NW SE 25-2s-2e
Set 8⅝-in. 85 ft., drilling 2,135 ft.

C. Robinson 1 Leech . . . . . NW SW NW 14-2s-8e
Fourth squeeze job, waiting on cement.

### White County

G. R. Hays Drlg. 1 Ackerman . . NW NW NW 32-5s-14w
Spud.

Jackson et al 1 W. A. Hamilton . . SW SE SW 13-7s-8e
Location.

Southern Pet. 1 McIntosh . . . . . NE NW SE 30-3s-8e
Glen Dean 2,642 ft., base Golconda 2,880-88 ft., Renault 3,181 ft., Aux Vases 3,193 ft., Aux Vases sand 3,202-21 ft., T.D. 3,245 ft., 5½-in. 3,187 ft., waiting on cement.

Skelly 1 E. Winter . . . . . NW NW SW 18-4s-10e
Aux Vases 3,118 ft., P.B. 3,136 ft., 40-qt. shot 3,021-36 ft., filled up 600 ft. oil and 50 ft. water, swabbed down, filled up 200 ft. oil and slight show water in 2-hr. test.

R. Warren 1 Brimbe-Combe . . . . . SE SE NW 36-5s-9e
Palestine 2,242-70 ft., Menard 2,315 ft., Waltersburg 2,400-15 ft., Tar Springs 2,473-2,535 ft., Glen Dean 2,548 ft., drilling 2,875 ft.

*(Continued on Page 124)*

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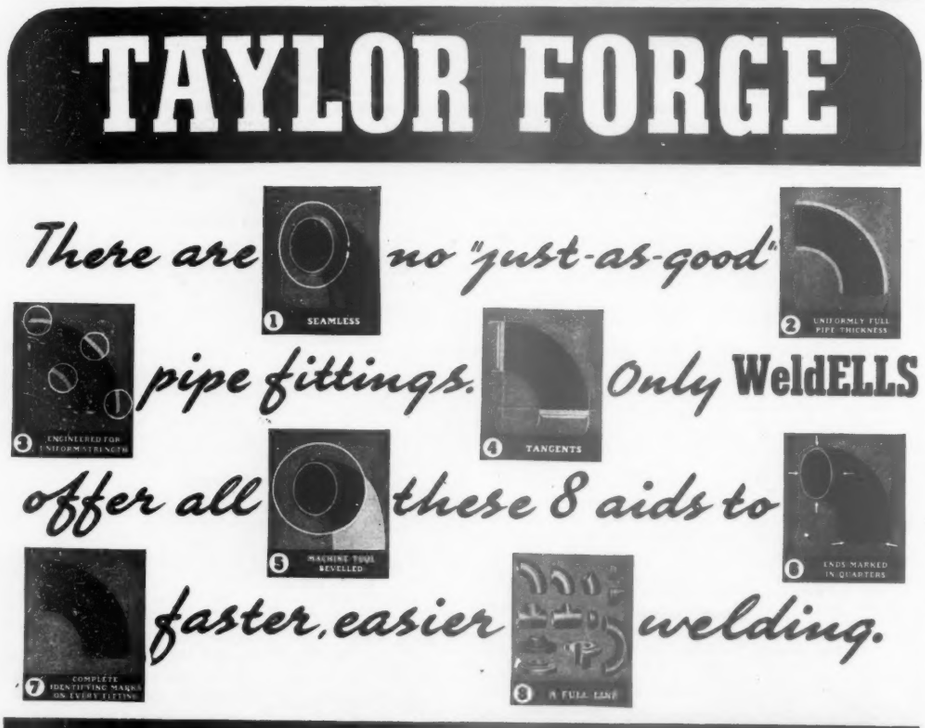
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# Deep Morgantown Well To Test Chestnut Ridge Anticline

By STAFF CORRESPONDENT

PITTSBURGH, Pa., Feb. 24.—During the past week 18 operations were completed in the lower eastern fields, of which 4 were dry and 14 were gas wells. There were also 2 gas wells drilled deeper. Operations were slightly retarded by extreme cold weather.

A very important test is starting in Monongalia County, West Virginia, where the Hope Natural Gas Co. will test the closure on Chestnut Ridge south of the Cheat River. It is located on the axis of the anticline on the H. C. Greer et al tract in Morgan district and starts at an elevation of 1,462 ft. On the Quad, it is located .45 mile south Lat 39° 55′ and 1.20 miles west Long 79° 50′ or about 6½ miles south 45° east of Morgantown and near the Greer lime works.

In 1918-19 this company drilled a test on the Kendall Lumber Co. tract in Union district, Monongalia County, located about 4 miles northeast of this new test along the axis of the anticline and about .4 mile west of the axis. It was drilled to 5,267 ft. without reaching the lower Devonian and abandoned at that depth on account of a bad hole. This test started at an elevation of 860 ft. or about 100-150 ft. below the base of the Berea. The structure is one of the major anticlines and with its closure presents possibilities. One test north of the Cheat River in Springhill Township, Fayette County, Pennsylvania, and on the Paul Dunham farm about 1.1 miles north of the state line, drilled through the Oriskany which was dry and also without salt water. It, however, passed through a fault below the Tully lime and it was presumed to have been bottomed on the downthrow side.

In Ravenswood district, Jackson County, another wildcat is being started by Columbian Carbon Co., which is located on the J. E. Sweezy et al farm. On the Quad, it is located 1.70 miles south Lat. 38° 55′ and 2.95 miles west Long. 81° 55′. It starts at an elevation of 655.1 ft. Here Joe Rubin et al are drilling 1 H. O. Maddox at 745 ft. and rigging up wildcats on the William Hunter and James T. Curry farms. In Ripley district, the United Carbon Co. is drilling at 1,050 ft. in the wildcat on the D. F. Hyre farm.

In Harrison County Hope Natural Gas Co. resumed drilling the deep rotary test on the C. S. Gribble farm in Grant district after being delayed with a fishing job and reached 9,850 ft. and still in the Medina series.

### SUMMARY OF COMPLETIONS

*West Virginia*

| | No. | Prod. | Footage |
|---|---|---|---|
| Gas wells: Oriskany field | 1 | *0.9 | 5,081 |
| Others | 4 | *0.3 | 9,375 |
| Dry holes | 2 | | 3,783 |
| Total | 7 | | 16,941 |
| Recompletions | 2 | *0.4 | |

*Southwest Pennsylvania*

| | | | |
|---|---|---|---|
| Gas wells | 9 | *1.5 | 28,767 |
| Dry holes | 2 | | 5,882 |
| Total | 11 | | 34,649 |

*Million cu. ft.

**Boone County**

Peytona district: Owens, Libby-Owens 30 Allen & Pryor, 162,000 cu. ft. gas, Big lime and Berea, T.D. 1,843 ft.

Washington district: Pond Fork Oil & Gas Co. 7 fee, 25 bbl., Salt sand, T.D. 1,425 ft. Located about 3 mi. N of Jefferies.

**Braxton County**

Birch district: Pittsburgh & W. Va. Gas Co. 7779 Ida Young, 21,300 cu. ft. gas, through Injun sand, T.D. 2,006 ft.

Pittsburgh & W. Va. Gas Co. 7785 Ed L. Boggs, dry, through Injun sand, T.D. 1,788 ft.

**Cabell County**

McComas district: Barboursville Fuel Co. (G. L. Meabon, trustee) 1 Floyd Albert, 134,400 cu. ft. gas, Big lime 1,440-1,590 ft., Injun 1,600-35 ft., Berea 2,252-55 ft., brown shale 3,055-3,290 ft., brown shale 3,526-60 ft., Corniferous lime 3,560 ft.

**Clay County**

Union district: Thompson Gas Co. T-52 Thompson Land &Coal Co., 30,000 cu. ft. gas, Injun sand, T.D. 1,966 ft.

**Lincoln County**

Duval district: Reishman Bros. 3 Thomas Nelson, drilled deeper, 68,000 cu. ft. gas, old T.D. 2,460 ft., brown shale 3,494-3,588 ft., 3,662-3,711 ft., 3,730-3,839 ft.; gray slate 3,839-50 ft.; broken slate 4,050-4,312 ft.; Corniferous lime 4,312 ft.; shot 3,400-3,854 ft.

Union district: Huntington Dev. Gas Co. 56 William Greer Adkins and Minnie Adkins, drilled deeper, 353,000 cu. ft. gas, old T.D. 2,185 ft., gray shale 2,890-3,133 ft., brown shale 3,133-3,442 ft., shot 2,900-3,447 ft.

**Ritchie County**

Clay district: McBurney et al 1 G. H. Darnell, dry, Injun sand, T.D. 1,995 ft.

### ORISKANY FIELDS

**Kanawha County**

Poca district: Hays Oil & Gas Co. 1 J. H. Young, 852,000 cu. ft. gas, natural, Corniferous lime 4,924 ft., Oriskany 5,040 ft., T.D. 5,081 ft.

### DRILLING

Poca district: Joe Rubin 1 E. M. Derrick, top Corniferous lime 4,897 ft., ran 5¼-in. casing to 4,917 ft.

W. Va. Gas Corp. 1 L. H. Harrison, 1,518,000 cu. ft. gas, Corniferous lime 4,838 ft., Oriskany 4,945 ft., drilling 4,966 ft.

W. Va. Gas Corp. 1 L. O. Fisher, 431,000 cu. ft. gas, Corniferous lime 5,009 ft., Oriskany 5,106 ft., drill-

*(Continued on Page 124)*

8-cylinder 130-275 H.P. Model RXIV Le Roi Engine, operating pipe line pumping unit.

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# Wilcox Tests in Rapides and Evangeline Run High

By F. L. SINGLETON

NEW ORLEANS, La., Feb. 24.—With the St. Gabriel prospect, Iberville Parish, established as the district's second new field of the year, operators in the Louisiana Gulf Coast district shifted their attention to the Wilcox trend as two wildcats in Rapides and Evangeline parishes were reported to be running structurally high.

Titanic Oil Co. 1 Natalbany Lumber Co., located on the St. Gabriel prospect, Iberville Parish, is flowing at the daily rate of 250 bbl. of 30.1-gravity oil through a 9/64-in. choke, while testing through perforated casing at 7,766-76 ft. Tubing pressure is 2,370 lb. and casing pressure 2,790 lb. The well is bottomed at 9,031 ft., and completion was made following a drill-stem test which recovered 4 bbl. of 29.7-gravity oil. Location is in 7-9s-12e, on a farmout lease from Shell Oil Co., Inc., and the well is the third to be drilled in the area being located ½ mile north of a 10,000-ft. dry hole that was abandoned the past year. That future development may open production from additional sand section is indicated by the electrical survey which showed favorable indications at 6,680-92 ft., 6,901-06 ft., and 9,010-25 ft.

## SUMMARY OF COMPLETIONS

| | No. | Bbl. | Footage |
|---|---|---|---|
| Oil wells: Fields | 10 | 2,095 | 75,275 |
| Gas wells: Fields | 1 | ..... | 10,990 |
| Dry holes: Fields | 3 | ..... | 18,062 |
| Total | 14 | ..... | 104,327 |

## Wilcox Trend

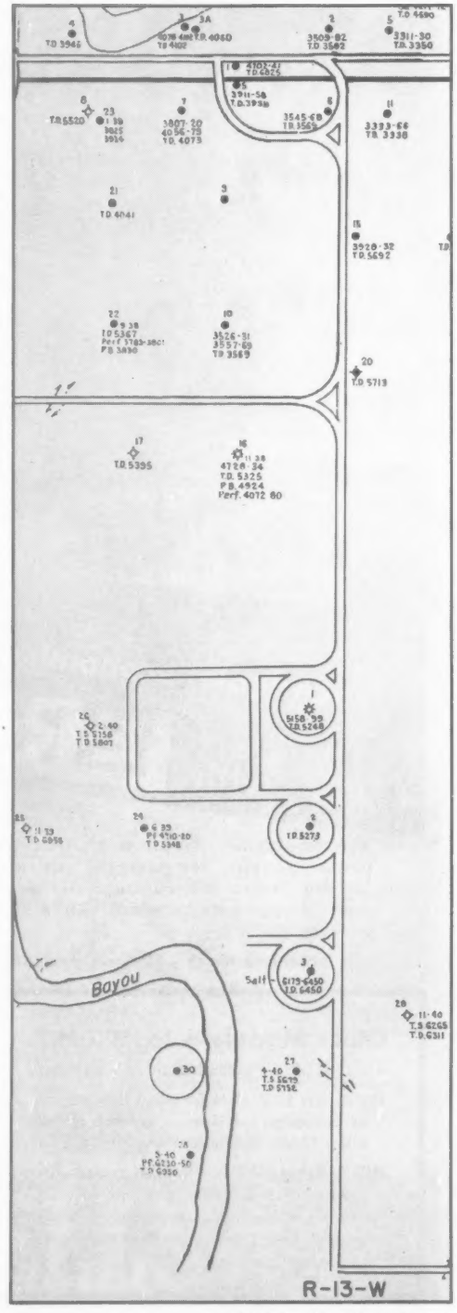
The Wilcox trend sector extending through the northern tier of parishes which has been inactive for the past several months was holding considerable attention as two wells located in the Glenmora area, Rapides Parish, and the Basile area, Evangeline Parish, reached critical stages with both wells reported to be checking structurally high. In the Glenmora area, Crosby Drilling Co. 1 Phillips topped the Sparta at 6,951 ft., and the well is coring ahead below 7,300 ft. Ten feet of sand with no shows was recovered in a core at 7,290-7,300 ft. Correlated with S. W. Richardson 1 Heflands, a dry hole located to the west in 21-1s-3w, the well is reported to be 70 ft. structurally higher. The well is located in 15-1s-2w, and is being drilled on a farmout from the California Co.

*Basile.*—In the Basile area, Evangeline Parish, Being Oil Co. 1 Fruge, 10-6s-2w, is drilling in salt-water sand below 7,451 ft. The well is reported to be running 200 ft. structurally higher than Basile Oil Co. 1 Haas in 14-6s-2w, and 300 ft. higher than Hamilton 1 Loewer in 39-6s-1e. The outcome of both wells should be determined by next week.

*Westwego.*—Titanic Oil Co.'s attempt to open commercial production from a new sand section in the newly opened Westwego area, Jefferson Parish, has apparently met with failure. The well was originally completed through perforated casing at 9,830-42 ft. from which it flowed 400 bbl. of fluid per day of which 240 bbl. was salt water and the remainder pipeline oil. The well was killed during the week, and on a test through perforated casing at 9,940-58 ft., it flowed 100 bbl. of fluid in 3 hours through an 8/64-in. choke. Seventy per cent was free water, 25 per cent mud and 5 per cent was 31-gravity oil. At the close of the week the well had been killed and the well is expected to be recompleted in the original sand section at 9,800 ft.

*Cameron Meadows.*—Magnolia Petroleum Co.'s long attempt to open commercial south flank production in the Cameron Meadows field, Cameron Parish, met with success as 30 Cameron Meadows was completed for an estimated initial production of 400 bbl. per day through a ¾-in. choke from perforated casing at 5,712-22 ft. Previous attempts to extend production on top of the dome into this area resulted in failures. The well is in 12-14s-13w, just south of several dry holes.

*Abbeville.*—The Abbeville field, Vermilion Parish, was extended ½ mile westward with the completion of Continental 1 C. P. Motty, which gaged 50 bbl. of distillate per day through a 12/64-in. choke from perforated casing at intervals from 10,315-60 ft. Tubing pressure was 3,600 lb. Total depth of the well is 10,566 ft. Location is in 18-12s-3e.




Zingery Map Co., Houston

*Magnolia 30 Cameron Meadows (indicated by circle) new sand discovery on south flank of Cameron Meadows field, Cameron Parish*

*Bayou Pigeon.*—In the Bayou Pigeon field, Iberia Parish, Plymouth 1 E. G. Tilley, east of the discovery well, was in the final stages of completion following a drill-stem test in which the well flowed at the rate of 23 bbl. oil per hour from perforated casing at 8,143-53 ft. The sand section is slightly lower than the discovery well which was completed at 8,052-72 ft.

*Iowa.*—Production from the newly opened 7,600-ft. sand in the Iowa field, Calcasieu-Jefferson Davis parishes, was extended to the north by Magnolia 17 Wait which is flowing at the rate of 512 bbl. of pipe-line oil per day through a 12/64-in. choke. Tubing pressure was 1,700 lb., and casing pressure 2,540 lb. The well was drilled to a total depth of 7,625 ft., and production was obtained by perforating casing at 7,616-21½ ft. This sand section was opened several months ago by Shell 32 Heyd, located several hundred feet to the south which was completed in this section after failing to produce from the 8,200-ft. basal Frio section, the discovery of which has led to a revival of drilling activity.

## LOUISIANA GULF COAST COMPLETIONS

### Avoyelles Parish

Eola field: Amerada 1 Vernon, 347 bbl., ⅝-in. choke, perf. casing 8,557-63 ft., T.D. 8,570 ft.

### Cameron Parish

Grand Lake field: Superior Oil Co. of California, 133 bbl., 7/64-in. choke, perf. casing 8,490-93 ft., T.D. 11,386 ft.

### Evangeline Parish

Ville Platte field: Gulf 1-B Hirsch, 422 bbl., ⅝-in. choke, sand 10,030-10,150 ft., T.D. 10,150 ft.

### Iberville Parish

Bayou Blue field: Navarro 2 Wilberts, 113 Bbl., 13/64-in. choke, T.D. 1,803 ft.

### La Fourche Parish

Chacahoula field: Sun 1-A Dibert Stark-Brown, dry, T.D. 1,581 ft.

Bayou des Allemands field: Amerada 5 Gheens Realty Co., 76 bbl., 20 hr., 5/32-in. choke, perf. casing 9,884-90 ft., T.D. 10,016 ft.

Lake Long field: Fohs 13 State, 175 bbl., 11/64-in. choke, perf. casing 9,392-9,400 ft., T.D. 10,160 ft.

Valentine field: Pan American 22 Harang, 116 bbl., 9/64-in. choke, top sand 3,952 ft., T.D. 3,964 ft.

### Plaquemines Parish

Garden Island field: Texas 50 State, 194 bbl., 5/32-in. choke, perf. casing 5,970-6,000 ft., T.D. 6,366 ft.

Grand Bay field: Gulf 12 State, 292 bbl., 5/32-in. choke, perf. casing 8,118-25 ft., T.D. 8,130 ft.

### St. Martin Parish

Anse La Butte field: Stanolind 1-A Bergeron, 227 bbl., 5/32-in. choke, T.D. 4,775 ft., P.B. 4,730 ft.

Happytown field: Shell 3 Iberville Land Co., dry, T.D. 9,976 ft.

### St. Mary Parish

Bateman Lake field: Texas 2 St. Mary Parish School Board, gas well, perf. casing 10,695-10,790 ft., T.D. 10,990 ft.

### Terrebonne Parish

Lake Pelto field: Texas 35 State, dry, T.D. 6,505 ft.

## LOUISIANA GULF COAST DRILLING REPORT

### Calcasieu Parish

Gulf 1 Calcasieu National Bank, Hayes prospect, 18-11s-5w, drilling shale 8,155 ft.

### Iberia Parish

Gulf 1 Pettit Anse Co., Avery Island dome, 59-13s-6e, drilling shale 10,080 ft.

### La Fourche Parish

Gulf 1 State, Bay Marchand, 23s-23e, derrick, moving in rig.

### Plaquemines Parish

Phillips 1 State-Bastian Bay, 48-20s-29e, drilling shale 9,198 ft.

Texas 1 State-Delacroix, 34-15s-15e, drilling sandy shale 8,212 ft.

Texas 1 State-Octave Pass, 32-20s-20e, drilling sandy shale 10,108 ft.

### St. Bernard Parish

California Co. and Tide Water 1 Biloxi Marsh Lands Co., 25-12s-16e, T.D. 10,053 ft., conditioning mud.

### St. Martin Parish

Shell 1 State, Duck Lake prospect, 1-15s-11e, T.D. 8,600 ft., preparing to core.

### St. Mary Parish

Humble 1 Miami Corp., 15-15s-6e, drilling shale 9,350 ft.

### St. Tammany Parish

W. T. Burton 5 State-Lake Ponchartrain, S.D. 8,200 ft.

### Terrebonne Parish

Stanolind 1 Continental Land & Fur Co., Lake Piquant prospect, 34-17s-14e, drilling shale 10,346 ft.

### Vermilion Parish

Texas 1 Broussard, Erath field, 21-13s-4e, drilling shale and lime 7,420 ft.

### West Baton Rouge Parish

Amerada 1 A. Wilbert, Port Allen prospect, 26-7s-11e, drilling shale 6,567 ft.

## West Central Texas Fields

*(Continued from Page 107)*

Elgin & Watson 1 Watson, NE NW Sec. 10, Blk. 2, T.&P. Sur., S.D. 4,065 ft.
Hickok Prod. and Reynolds 1 J. R. Halsell, 467 ft. from S and W lines, Sec. 92, B.B.B.&C. Sur., Abst. 105, 5,500-ft. test, drilling 1,218 ft.

**Shackelford County**

R. H. Roark 1 Lee, 1,170 ft. from N and 2,790 ft. from E line Sec. 37, Blk. 12, T.&P. Sur., 1,250-ft. test, S.D. for orders, 210 ft.

**Taylor County**

Ce-Beth Oil 1 City of Alibene, south shore of Lake Alibene on city property, 4,000-ft. test, T.D. 2,300 ft., S.D.
J. Bay Robertson and J. B. Dunigan 1 G. O. Creswell, SE SE SW G. Hancock Sur., 3,850-ft. test, T.D. 3,400 ft., prep. plug.
J. T. Anderson 1 Eula T. Stith, 6,640 ft. from W and 330 ft. from N lines of R. Turner Sur. 25, 2,250-ft. test, location.

## Eastern Texas Fields

*(Continued from Page 114)*

Beddinghouse 1 J. A. McCreary, H. Huejas Sur., 6 mi. SW mi. Enterprise, pits.

**Upshur County**

Sun Oil 1 W. C. Henderson, NW cor. of 27-acre tract in 100-acre tract in Robinson Asher Sur., just outside town of Ore City, 7,000-ft. test, top Nacatoch 1,815 ft., Pecan Gap 2,320 ft., Blossom 3,090 ft., Georgetown lime 3,784 ft., coring 4,692 ft.

**Wood County**

Travis & Stoddard 1 Bryan, C. M. Patton Sur., 1½ mi. W Hawkins, 467 ft. from N and E lines of survey, location.
Bill Urbank 1 J. A. Snider, NE cor. 73-acre tract in Castleberry Sur., 1½ mi. NE of Hawkins, S.D. 1,750 ft.
E. B. Germany 1 Menchew, George Brewer Sur., Hawkins townsite, top Woodbine 4,270 ft., est. 50 bbl. oil per hr., T.D. 4,804 ft.
Humble 1 Bryant, 467 ft. from N and W lines of W. Parker Sur., in Hawkins area, drilling 2,310 ft.
Humble 1 Williams, 1,400 ft. from S and 467 ft. from W lines B. H. Hamilton Sur., in Hawkins area, drilling 1,000 ft.
Humble 1 Clift, 106-acre tract in James Pollack Sur., in Hawkins area, derrick.
Jackson & McGlothlin 1 Moore, 10-acre trace in Joseph Knight Sur. in Crown townsite, Woodbine sand test, moving in material.
Ryan Consolidated Oil and W. C. McGlothlin 1 Gout, Wm. Clark Sur., near Crow, rigging up.

## Southwest Texas Fields

*(Continued from Page 103)*

Bay-Tex Oil Corp. 12 Union Central Life Ins. Co., 168 bbl., ⅛-in. choke, perf. casing 6,513-23 ft., T.D. 6,805 ft.
Southern Minerals Corp. 4 Sellers, 84 bbl., 7/64-in. choke, perf. casing 6,504-12 ft., T.D. 6,612 ft.
Southern Minerals Corp. 6 Sellers, 76 bbl., 7/64-in. choke, perf. casing 6,405-21 ft., T.D. 6,632 ft.

**Refugio County**

Fagan field: Barnsdall 5 Marberry, 58 bbl., 5/64-in. choke, perf. casing 5,660-63 ft., T.D. 5,664 ft.
Tomoconnor field: Quintana 25-A Williams, 104 bbl., ⅛-in. choke, perf. casing 5,747-5,855 ft., T.D. 5,922 ft.

**Victoria County**

North Keeran field: Barnsdall 10 Keeran, dry, T.D. 7,515 ft.
Terrell field: Sunray 1 Terrell, dry, T.D. 5,271 ft.

**LAREDO DISTRICT**

**Duval County**

Casa Blanca field: Bajees Oil Co. 1 Martin, dry, T.D. 1,221 ft.
Cedro Hill field: Magnolia 26 Duval County Ranch Co., dry, T.D. 2,107 ft.
Cole field: H. W. Brewer 1 Harper, dry, T.D. 1,775 ft.
Wildcat: Continental 5-B Driscoll, dry, T.D. 4,521 ft.
Osborn & Superior Oil Co. of Oklahoma 1 Kreis, dry, T.D. 3,433 ft.

**Jim Hogg County**

Colorado field: Humble 26 Atwood, 50 bbl., 5/32-in. choke, T.D. 3,112 ft.
Kelsey field: Magnolia 2 State-Marshall, 152 bbl., ⅛-in. choke, perf. casing 4,730-33 ft., T.D. 4,741 ft.
Sun 1 Trevino, dry, T.D. 4,836 ft.
Manila field: Appell & Robertson 2 Wood, dry, T.D. 2,604 ft.

**Live Oak County**

White Creek field: Coquat et al 5-A Cox, 12 bbl., pumping, perf. casing 1,295-1,316 ft., T.D. 1,318 ft.
Wildcat: Becham et al 1 Atkinson, dry, T.D. 913 ft.

**McMullen County**

Wildcat: Van Dresar 5 Brown, dry, T.D. 801 ft.

**Webb County**

Glen field: Transwestern 5 Yeager-Stroman, 174 bbl., pumping, sand 2,159-77 ft., T.D.
Wildcat: W. H. Holland 1 Bruni, dry, T.D. 3,007 ft.
Sam Cunningham 1 Donnelly, dry, T.D. 2,610 ft.

**Zapata County**

Lopeno field: Jay Simmons 1 Ramirez, gas well, perf. casing 2,290-2,326 ft., T.D. 2,551 ft.
Jay Simmons 2 Ramirez, gas well, perf. casing 2,220-60 ft., T.D. 2,482 ft.

**SAN ANTONIO DISTRICT**

**Bexar County**

Gas Ridge field: Southwest Drilling Co. 8 Covell, 2 bbl., pumping, T.D. 425 ft.
Southwest Drilling Co. 10 Covell, 2 bbl., pumping, T.D. 435 ft.

**Caldwell County**

Tenney Creek field: Wiegand 2 DeVaughn, 220 bbl., 18 hr., ¼-in. choke, top chalk 2,485 ft., base chalk 2,666 ft., T.D. 2,701 ft.

**Guadalupe County**

Elm Creek field: J. E. West 3 Lenz, 3 bbl., pumping, T.D. 800 ft.
Wildcat: C. G. Hamill 1 Boeck, dry, T.D. 2,566 ft.

**SOUTHWEST TEXAS DRILLING REPORT**

**Bastrop County**

Marts & Beaven 1 Walker, G. Glasscock Sur., drilling 1,990 ft.

**Bee County**

Pummill Oil Co., Inc., 1 Wittman, John Ryan Sur., S.D. 3,800 ft.

**Cameron County**

Pure et al 4 Gatewood Newberry, 6 mi. SW of Point Isabel, coring sand 8,864 ft.

**Dimmit County**

Humble 1 Catarina Farms, T.&N.O. Sur., drilling sand 2,279 ft.

**Jim Hogg County**

Sun 1 Ella Campbell, 8 mi. S of Hebronville, coring sand 4,026 ft.

**Kleberg County**

Skelly 1-388 State, Baffin Bay field, drilling shale 9,875 ft.

**La Salle County**

William H. Spice 1 D. C. Reed, T. Conlan Sur. 124, top Wilcox 3,580 ft., coring shale 4,648 ft.

**Lee County**

Shell 1 Brown, A. Burchard Sur., SE of Tanglewood, drilling sandy shale 3,036 ft.

**Nueces County**

Stanolind 1 K. L. Shaffer, 1 mi. W of Luby field, dry, T.D. 7,483 ft.
Sun 1 Klostermann, 5½ mi. SE of Robstown, drilling shale 5,680 ft.

**Live Oak County**

Edwin M. Jones 3-B George West, Nelson Owen Sur. 56, coring shale 8,215 ft.

**Refugio County**

Southern Minerals 1 R. H. Wood, 3 mi. SE of Refugio, drilling shale 2,185 ft.

**Starr County**

Continental 1-D F. D. Davenport, 1 mi. S of Rincon field, Sur. 485, drilling shale 4,510 ft.

**Willacy County**

Pan American 1 Kent, 1½ mi. NW of Williamar field, T.D. 8,814 ft., prepare to core.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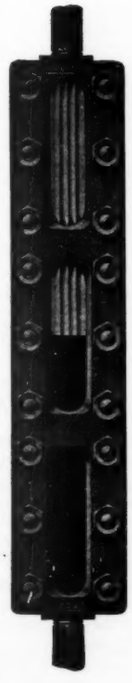

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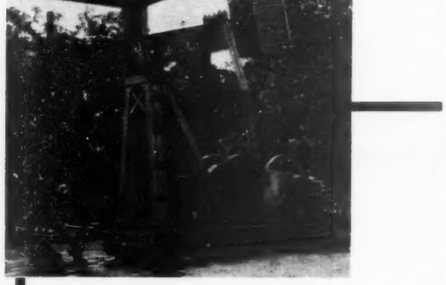

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# Oceana County Prospect and Big Adams Well Raise Hopes

By OTTO C. PRESSPRICH

SAGINAW, Mich., Feb. 24.—After several lean months "things were looking up" in the Michigan oil industry last week as a wildcat discovery gave promise of a new field in Oceana County and an Adams field completion was recorded with a potential of 5,280 bbl. a day, one of the biggest producers ever completed in the Michigan basin area and raising the field to new importance.

The Oceana discovery may be the first important find in Michigan in 2 years. The test, a development of the American Drilling Co. of Saginaw, was capped Friday when the hole unexpectedly struck oil while drilling at 1,782 ft. Tanks and casing were being hurried to the scene over the week end and the company planned to drill in the test the first of the week, hopes high that production might run as high as 50 bbl. an hour.

The well is in Section 9, Crystal Township, on Michigan's west coast, near the Lake Michigan shore. It is about 12 miles southwest of Hart, where a few small wells are located. The test is being drilled in the midst of a block of 6,000 acres leased to American Drilling Co. and Charles W. Teater of Saginaw. The good showing was gratifying to company officials especially since the Traverse formation, they said, is running considerably higher than has been the case in other tests in that part of the state. A few tests to the east and north were unsuccessful about 2 years ago. Another Ocean test, by Muskegon Development Co. in Section 23 of Otto Township, was completed last week as a dry hole at a depth of 1,975 ft.

The big Adams well is the Rayburn & Major 3 Yenior in Section 22. Completed at 2,888 ft., its open flow was 220 bbl. an hour. It is an offset to the discovery well. Second big well of the week in the North Adams field was the C. W. Teater 3 Rockafellow, also in Section 22. Acid treated, its potential jumped to 1,752 bbl. a day from the Dundee; a 4-hour test averaged 70 bbl. an hour, after which it was pinched in.

Other early completions were in prospect in the area. Chapman Oil Co. 2 McTaggert in Section 26 of the older south field reported oil in the hole and a pump test planned before acidizing. The hole was at a depth of 2,982 ft. and 152 ft. in the Dundee. Pure Oil Co. started deepening A-2 State, a wildcat in Section 15, drilled last week into Dundee water at 3,042 ft. Objective is the Monroe, down about 300 ft. Don Rayburn and Ervin Major were ready to drill into Dundee in 1 Codner in Section 22 and Rayburn's 2 Mile, Section 23, had hole full of oil in Dundee at 2,952 ft. It was to get acid treatment.

From the completions standpoint the week was the year's most active. Of the 26 completions, 10 are producers, 15 were dry holes and the other is a natural-gas well, one of the best yet drilled in Gratiot County and one that sets the stage for numerous other tests in Sumner Township. That northeastern Michigan well is the W. E. Ross 1 Wanamaker in Section 31. Its open flow was 8,340,000 cu. ft. a day from Michigan stray at 980 ft. Drilling was scheduled to start shortly on C. M. Carothers 1 Hawes, wildcat in Section 17, 3 miles north of the Sumner-New Haven gas production.

Last hopes of commercial production in Huron County went glimmering last week with abandonment of three tests, including the 1 Johnston "discovery" in Section 8, Bloomfield Township, which brought a flurry of development after a good oil show late last spring. The test had been deepened to 3,422 ft. in hope of improving its prospects. Also dry was Cryden Petroleum Co. 1 McIntyre in Section 16 and the Gordon Walker 1 Hellems in Section 17, Dwight Township. Abandoning of these three tests brought drilling activity to an end in Huron County.

Of the other dry holes, a number were wildcat tests. These included developments in St. Joseph and Kalkaska counties. Five of six Allegan completions were dry holes, the lone producer rating 50 bbl. a day. Three small wells were completed in Ottawa County, one in Van Buren. The only other completion in the southwest part of the state was a dry hole in Kent County.

Possibilities of the Clare-Winterfield district improved last week as Sun Oil Co. B-1 State-Winterfield, in Section 36, east offset to the discovery well, was completed for better than 240 bbl. naturally. The well flowed 180 bbl. the fourth day through a ¼-in. choke. Production is from Dundee, topped at 3,785 ft., bottomed at 3,791 ft. It is the best well thus far in the area and heralded other tests.

An attention holder was Union Drilling & Producing Co. 1 Consumers Power Co. wildcat in Section 16, Summerfield Township. The test picked up gas in Michigan stray, oil in the Traverse around 3,080 ft., now is at 3,700 ft., headed for Dundee. Drilling continued on Clare's deepest test, Sun Oil Co. 1 McIntosh in Section 16, Hamilton Township. With the Sylvania as the goal, drilling was below 5,300 ft.

Using special equipment, Gulf Refining Co. was nearly finished with cleanup of the 7,776-ft. 1 Bateson deep test in Monitor Bay. About 6,000 ft. of the pipe has been recovered. The Bateson is to be drilled to about 9,000 ft. Operations were halted by a gas explosion and fire last December. In Monitor, Section 3, United Drillers & Producers 1 Kircher was completed as a 64-bbl. producer at 2,887 ft.

In Clare County Lupher Drilling Co. abandoned B-1 Bowman, Section 27, Vernon Township, south offset to Nollem Oil & Gas Co. discovery which has been flowing for 11 years. The test got a show of oil at 3,783 ft. but ran into water at 3,819 ft.

The state Conservation Department issued 14 permits for oil and gas exploration in nine counties during the week. New tests are scheduled at a considerably lower rate than in the early months last year. The 1941 total thus far is only 111. Four of the week's issue are for Ottawa County tests, three for Allegan. One each went to Clare, Van Buren, Midland, Gladwin, Kalamazoo, Montcalm and Arenac.

## SUMMARY OF COMPLETIONS

| | No. | Bbl. | Footage |
|---|---|---|---|
| Oil wells: Allegan County | 1 | 50 | 1,358 |
| Arenac County | 2 | 7,032 | 5,780 |
| Bay County | 1 | 64 | 2,887 |
| Clare County | 1 | 240 | 3,791 |
| Midland County | 1 | 151 | 3,406 |
| Ottawa County | 3 | 120 | 5,530 |
| Van Buren County | 1 | 150 | 1,280 |
| Gas wells: Gratiot County | 1 | *8.34 | 980 |
| Dry holes: Allegan County | 5 | ..... | 7,318 |
| Huron County | 3 | ..... | 10,304 |
| Others | 7 | ..... | 15,417 |
| Total | 26 | ..... | 58,051 |

*Million cu. ft.

## MICHIGAN COMPLETIONS

### Allegan County

Cheshire Township: Clapsaddle & Harris 1 Wall, NW NE SE 31-1n-14w, dry, T.D. 1,279 ft.
Heath Township: Charles W. Cook 1 Larson, SE NE NE 26-3n-14w, dry, T.D. 1,488 ft.
Overisel Township: W. L. McClanahan 1 Broekhuis, SE SW SE 11-4n-14w, dry, T.D. 1,602 ft.
Regal Dutch Petroleum Co. 1 Van Dam, NW NE NE 26-3n-14w, dry, T.D. 1,598 ft.
Trowbridge Township: Miller Brothers 1 Green, NW SW NW 21-1n-13w, 50 bbl., acid, T.D. 1,358 ft.
C. J. Stevens 1 Shafer, NE SE SW 29-1n-14w, dry, T.D. 1,351 ft.

### Arenac County

Adams Township: Rayburn & Major 3 Yenior, SE SW NE 22-19n-3e, 5,280 bbl., naturally, T.D. 2,888 ft.
Charles W. Teater 3 Rockafellow, SW SE NE 22-19n-3e, 1,752 bbl., acid, T.D. 2,892 ft.

*(Continued on Page 124)*

By

T. R. INGRAM

# Wyoming Senate Votes Down Compact Proposal

DENVER, Colo., Feb. 24. — The Wyoming Senate, fearful that the state's quota allowed under the compact might be frozen at present production figures, voted down an administration measure authorizing the governor to execute an agreement with the oil-compact states. Best wells for the week were Sinclair-Wyoming 15 Wertz, Wertz field, for 2,094 bbl., and Argo 15-A Elliott, Lance Creek, for 2,400 bbl. North La Barge Oil 6 Government was a 20-bbl. pumper in first sand in La Barge field. Cut Bank had one oil well, Santa Rita 5 Government, for 245 bbl. Two small oil wells and one dry hole were completed in the Rangely field in Colorado. Montana had a number of gas-well completions, including two small ones in the Hardin district, one for 20,300,000 cu. ft. in the Bowes field for Montana Gas, two in the Cedar Creek field for Montana-Dakota Utilities, two for the same company in the Bowdoin field in Phillips County. Hole Brothers wildcat in the Aloe district was dry and abandoned and limits of Devon field on north were defined in Frank Walsh 2 Mowat.

## COLORADO

### Boulder County

Bartson Oil 1 Chenberg ..... SW SW SE 15-2n-70w
Standing 110 ft., 12½-in. at 65 ft.
J. A. Warren 3 Maxwell .... NW NE NW 24-1n-71w
Drilling 1,255 ft. in shale, good show free oil with some gas.

## SUMMARY OF COMPLETIONS

*Colorado*

| | No. | Prod. | Footage |
|---|---|---|---|
| Oil wells | 2 | 15 | 3,022 |
| Dry holes | 1 | ..... | 1,443 |
| Total | 3 | ..... | 4,465 |
| *Wyoming* | | | |
| Oil wells | 3 | 4,514 | 12,641 |
| *Montana* | | | |
| Oil wells | 1 | 245 | 2,961 |
| Gas wells | 7 | ..... | 7,403 |
| Dry holes | 2 | ..... | 3,706 |
| Total | 10 | ..... | 14,070 |

Gas, 24,480 M. cu. ft.

### El Paso County

F. F. Hintze 1 State ..... CEL SE SE 16-11s-60w
Drilling shale 1,830 ft.

### Huerfano County

I. E. Sideman-White 1-X Martinez SW NE 33-26s-67w
Drilling below 1,674 ft.

### La Plata County

E. B. Klem 1 Olbert ..... NW SW 9-35n-12w
S.D. 4,050 ft. account weather, resume March 15.
Nick Spatter 1-X Bryce ..... SW SW 31-33n-9w
T.D. 4,400 ft., recemented caves at 4,000 ft.

### Larimer County

E. P. Gallup 1 Hanson ..... C SE NW 36-10n-71w
S.D. 312 ft., unable to shut off water.

### Las Animas County

Barney Oil 1 Dutto-Marchisio ..... NW NW 32-33n-62w
Drilling 1,160 ft.

### Logan County

West Plains 1 Sheldon ..... SE NW SW 3-10n-55w
Drilling 3,412 ft. in shale.

### Moffat County

Mountain Fuel Supply Co. has made a location in the East Hiawatha field for its 7 Florence Wilson, a northeast offset to 5 Wilson which was completed in 1940 as an oil well at 2,592 ft., total depth, for 327 bbl. first 24 hours. New operation will go to the same horizon, starting in a 10¾-in. hole and will be drilled with rotary tools.

Mountain Fuel Supply 7 Wilson ..... NE SW NW 23-12n-100w
Moving in, first report.
Mountain Fuel Supply 3 Musser ..... CNL NW SW 5-11n-97w
Rigging.

C. R. Privett 1 Strelling ..... NE SE SE 12-5n-96w
Moving in.
Steamboat Springs Synd. 1 Sutton NE NE SW 1-5n-96w
T.D. 2,335 ft., show oil with water, moving in 5-in. for shutoff.

### Rio Blanco County

W. L. W. Royalty Corp. 1 Rector, SE 34-2n-102w, southeast side Rangely field, was abandoned at 1,443 ft.

Raven Oil & Refining 31 Government, SW NW NE 31-2n-102w, was completed for 8 bbl. a day in fault zone at 1,500 ft.

John Bockhold 6 Government, SE SE SW 2-1n-102w, was completed at 1,522 ft. for 7 bbl. a day.

John Bockhold 10 Government ..... Lot 10, 3-1n-102w
Drilling gray shale 125 ft., first report.
Texas-California 5 Unit ..... NW NE NE 34-3n-94w
Coring for Sundance at 6,471 ft.

### Routt County

Mid-Colorado Pet. 1 Omholt ..... NE NE SE 29-4n-87w
T.D. 3,160 ft., recementing 6⅝-in. at 2,967 ft. to shut off Dakota water.
Craig-Moore 1-X Erwin ..... C SW NE 33-7n-85w
Drilling 2,622 ft.

## WYOMING

The administration measure introduced in both houses of the Wyoming Legislature authorizing the governor to execute a contract on behalf of the state with other states and become a member of the interstate oil compact, was voted down in the senate, only two votes being cast in its favor. Opposition developed principally on the ground that the federal Government had not encouraged oil development in Wyoming and that due to drastic conditions governing drilling on federal land the state had lost some of its markets and until production was permitted to be built up to former levels it was unwise to join the compact states. In 1923 Wyoming's ratio to American markets was 6.2 and now it is 1.9 and fear was expressed that Wyoming's quota might be frozen at that point. Production is on the upswing and amounted to 25,600,000 bbl. in 1940 as against 11,000,000 bbl. during the depression period. Until it again reaches the peak of 45,000,000 bbl. in 1923, the independents felt that future production should not be limited, and the state permitted to recapture its lost markets. Production in 1941 is expected to continue to gain over 1940. Wildcatting on federal land was brought to a standstill under the Hoover administration and under the prevailing rules and regulations, particularly the high-royalty scale, prospecting for new fields has been handicapped. However, the fact that Wyoming fields are not prorated by any governmental agency and that markets are being built up for new production, has been an incentive recently for expansion of operations.

### Big Horn County

N. B. Ketchersid 1 Mann ..... SW SW SW 11-55n-97w
Drilling 600 ft., formerly Valentine Kirk.

### Converse County

U. & I. Oil Synd. 1 Beaver ..... SE NW 29-35n-68w
T.D. 1,000 ft., moving in heavier machine, Walker dome.

### Carbon County

Sinclair-Wyoming 15-A Wertz, SW SW NE 7-26n-89w, which extends the Wertz field in the Tensleep one location east and south, was completed at 6,103 ft., total depth, for 2,094 bbl. first 24 hours. Top of the Tensleep was at 5,753 ft. and 7-in. was cemented at 5,754 ft.

Ohio 12 State ..... C W½ NE 34-20n-78w
Drilling 2,116 ft.
Sinclair-Wyoming 20 Wertz ..... NE SW NE 7-26n-89w
Spudded.
Sinclair-Wyoming 4-F Mahoney C SW NW 34-26n-88w
T.D. 4,413 ft., waiting on drill pipe.

### Fremont County

Indian Oil Co., agent for the Ohio Oil Co., has made a location in the Maverick Springs field, first well to be drilled in that area for 13 years. The field was opened up recently and oil is now being marketed on an increasing scale.

Indian Oil 2 Tribal ..... SW SW NW 23-6n-2w
Rigging up, first report.

### Hot Springs County

O. B. Grace 4 Government ..... Lot 2, 21-43n-92w
Drilling 197 ft., first report, Kirby Creek.

### Johnson County

The Billy Creek field, which recently was abandoned as a gas producer by the Carter Oil Co., proved a disappointment when some of the old gas wells were tested for oil by the Yale Oil Corp. under an agreement with the Carter company.

### Natrona County

Lewis Gebhert 1 Government, NW NE SE 10-39n-78w, on east side of Salt Creek, was abandoned at 1,948 ft., having failed to pick up shale production.

K. S. Albert 1 Young ..... NE SE 25-32n-82w
Spudded, first report, Iba district.
Royal Oil Corp. 1 Midert ..... SW SW SW 26-35n-80w
S.D. 1,508 ft.
Casper Creek Oil Co. 1 State SW SW SW 36-36n-81w
Drilling 2,394 ft.

### Niobrara County

Argo Oil Corp. had a good completion in the Leo sand in Lance Creek in its 15-A Elliott, NW NE SW 5-35n-65w, proven territory, at 5,370 ft., total depth. The 7-in. was cemented at 5,259 ft. and hole was acidized with 1,000 gal., and well made 100 bbl. an hour natural.

Continental 6 Rohlff ..... C SW SW 32-36n 65w
T.D. 5,450 ft., running 4½-in.
Continental 7-A Schuricht ..... SE NW SW 5-35n-65w
T.D. 5,376 ft., cemented 7-in. at 5,376 ft.
Ohio 19 Putnam ..... CWL NW 4-35n-65w
Moving in.
Continental 24 Tom Bell ..... NW NW NW 34-36n-65w
Drilling 5,188 ft. in lime.
Western Petroleum 1 Mosier ..... SW SW 31-35n-64w
Building rig.
Ohio 9 Agnes Rohlff ..... SE NE SE 32-36n-65w
T.D. 5,385 ft., 7-in. at 5,270 ft., testing through perf.

### Park County

Enalpac Oil & Gas 1 Cactus SW SE SE 33-51n-100w
Drilling 1,737 ft.
Stanolind 1 Rosenberg ..... NE NE NE 26-58n-98w
T.D. 2,887 ft., testing.
Resolute 2 State ..... SW SW 16-57n-101w
T.D. 10,121 ft., recemented whipstock at 7,408 ft., redrilled to 7,954 ft., and S.D.

### Sublette County

North La Barge Oil 6 Government, CNL SE NE 28-27n-113w, La Barge field, had water in second sand at 1,163-68 ft., plugged back and completed in sand at 1,030-1,145 ft. for 20 bbl. a day on the pump.

North La Barge Oil 7 Govt. ... C SE NE 28-27n-113w
Location, first report.
Charles Lackey 1 Government NE SE SW 33-27n-113w
Drilling 618 ft.
Klumpe Syndicate 1 ..... NE SW NE 28-27n-113w
T.D. 1,792 ft., prepare to run Schlumberger.
Texas 1-C Government ..... SW NW NW 24-27n-113w
Drilling 1,080 ft.
Marvel Oil 6 Government ... CEL SE SE 28-27n-113w
Rigging up.
North La Barge Oil 6 Govt. . CNL SE NE 28-27n-113w
T.D. 1,120 ft., prepare to test.

### Sweetwater County

Sinclair-Wyoming 96-A ..... NE SE NE 10-26n-90w
Drilling 894 ft.
Sinclair-Wyoming 95-A ..... SW NW NW 11-26n-90w
Drilling 3,098 ft.
Rocky Mountain Drlg. 1 State SW SW SW 36-20n-104w
S.D. 3,974 ft., for orders, no oil or gas.
Sinclair-Wyoming 98-A ..... NW NW SW 11-26n-90w
T.D. 667 ft., P.B. to 569 ft., swabbed 15 bbl. per hour from Wall Creek, top 390 ft., prepare to pump.
Sinclair-Wyoming 99-A ..... SW NW SW 11-26n-90w
Moving in to go to Wall Creek, first report.

### Uinta County

Stove Creek Oil 2 Govt. ..... C SW NW 26-14n-119w
Resumed, drilling 1,352 ft.

### Weston County

Lem Johnston 1 ..... NW SW 24-44n-63w
T.D. 3,563 ft., drilling new hole at 3,068 ft.
Lanam Crowley 1 ..... SW SW NW 8-46n-63w
Drilling shale 684 ft.

## MONTANA

### Big Horn County

O. T. Hardin 1, Lot 11, Block 12, 23-1s-33e, Hardin district, was completed in the Frontier at 670-95 ft. for 10,000 cu. ft. gas, pressure 135 lb.

Big Horn Oil & Gas Development Co. 44, NW SE NE 16-1s-33e, Hardin district, was completed in the Frontier at 775-90 ft., for 40,000 cu. ft., 95 lb. pressure.

### Blaine County

Montana Gas 2 Bjornsen, SE NE NW 34-32n-19e,

Bowes field, was completed in the Eagle sand at 845 ft. for 20,300,000 cu. ft., closed-in pressure 195 lb. The 8¾-in. is at 765 ft.

**Cascade County**

Bushford Pet. Synd. 1 Shannon-Roberts ..... C SW NE 12-20n-1e
Drilling 3,242 ft. in lime.

**Daniels County**

Copan O. & G. 2 Wiley ....NW NW NW 10-36n-50e
T.D. 1,928 ft., ready to resume drilling with rotary.

**Fergus County**

Hess & Tony 1 State ....CWL SW NE 36-22n-17e
Cemented 7-in. at 414 ft.

**Fallon County**

Montana-Dakota Utilities 149, C SW SW 7-4n-62e, Cedar Creek gas field, was completed at 1,461 ft. for 260,000 cu. ft. from the Eagle sand at 1,161-1,451 ft.

Same company's No. 150, CEL SW NE 13-4n-61e, was completed in the Eagle at 1,230-1,550 ft. for 414,000 cu. ft., 404 lb. pressure.

Montana-Dakota 152 ..... C SE SE 19-4n-62e
Drilling 105 ft., 8⅝-in. at 98 ft., first report.

**Glacier County**

The only completion in Cut Bank was Santa Rita 5 Government, SE NE NE 7-32n-5w, which swabbed 245 bbl. first 24 hours at 2,961 ft., total depth. The Sunburst sand at 2,755-70 ft. had a good show of oil, Cut Bank was at 2,920-50 ft., with the main pay at 2,940-50 ft. The 7-in. is at 2,926 ft.

Santa Rita 3 Jordan..... C SE NE 7-32n-5w
Spudded, first report.
A. B. Cobb 3 Tribal-187 ..... SE SE NW 19-32n-5w
Drilling 1,570 ft., top Colorado 395 ft., 10¾-in. at 408 ft.
Consolidated Gas 1 Tribal.....Lot 8, 10-34n-6w
Spudded.
Glacier Prod. 5 Van Ormer..near C NE NW 17-33n-5w
Cemented 10¾-in. at 575 ft., top Colorado 550 ft.
Glacier Prod. 3 McDougal..... C NW NW 31-34n-5w
Cemented 10¾-in. at 500 ft., top Colorado 485 ft.
Texas 1 Wills.....SW SW NE 19-32n-5w
Drilling 420 ft.
Ed Reagan 1 Tribal-194 .....CEL SE NE 22-37n-7w
Cemented 10¾-in. at 316 ft., building rotary rig.

**Liberty County**

C. E. Biggs 1..... C NE NW 22-37n-7e
Drilled to 430 ft. and S.D. in Claggett until spring.

**Phillips County**

Montana-Dakota Utilities 623, C NW NE 34-32n-33e, Bowdoin gas field, was completed in the Colorado shale at 1,042 ft., total depth, for 458,000 cu. ft., pressure, shut in, 230 lb.

Montana-Dakota Utilities 627, C SW SW 17-31n-34e, plugged back from 1,030 ft. to 852 ft. and completed in the Colorado shale for 998,000 cu. ft., 189 lb. closed-in pressure.

**Toole County**

Frank P. Walsh 2 Mowat, CSL NE NE 7-33n-2e, Devon field, was abandoned at 1,616 ft. in the Ellis. Location ½ mile northeast of 1 Mowat, completed last month for 1,750,000 cu. ft. It limits the field on the north.

Consumers Gas 2 Kurtuzfeld, NE NE SW 26-34n-1w, Kevin-Sunburst, was plugged and abandoned at 1,218 ft. Top of Sunburst 1,140 ft.

Hole Brothers 1 Potter, C NE NE 23-33n-4w, Aloe district, between Kevin-Sunburst and Cut Bank fields, was plugged and abandoned at 2,090 ft. The Sunburst was at 1,685-1,703 ft. and Cut Bank at 1,745-1,825 ft., and top of Madison 2,006 ft. Water was encountered at 2,006-38 ft. Estimated gas at 1,750-75 ft., was 300,000 cu. ft.

C. O. Bohn, trustee, 1 Moses..... CSL SE SE 2-31n-1w
Rig on ground.
E. Morton 3 Ellingson.....CNL NE NW 23-35n-3w
S.D. 106 ft.
Ohio 6 Carl Lind.....SW SE NW 11-35n-2w
T.D. 1,578 ft., waiting on 6⅝-in., 25,000 cu. ft. gas in Sunburst at 1,389-1,426 ft.
High Gravity Oil Prod. 1 Govt. SE NW NE 19-35n-3w
Drilling deeper at 2,179 ft., no results from acid.
Kevin Oil 4 Leach ..... C SE NE 31-35n-3w
T.D. 1,669 ft., cemented 7-in.
Pfabe & Engleking 13 Govt. .. CNL SE SE 19-35n-2w
T.D. 1,518 ft., acidized 500 gal., no results, will shoot and acidize again.
Montana Gas 1-X Nelson.....CSL SE NE 12-35n-1e
T.D. 2,135 ft., cemented 3-in.

## NORTHWEST NEW MEXICO

**Bernalillo County**

David H. Boyd 1 Wright.....11-10n-5e
Spudded to 55 ft. and S.D.

**San Miguel County**

Southwest Drilling, Inc., 1 Conchas NW NE 34-17n-21e
T.D. 2,735 ft., recemented 8-in. at 2,635 ft.

**San Juan County**

Southern Union Production 1 Cornell-Government, C SE SW 12-29n-12w, Fulcher basin, was completed in the Picture Cliff at 1,886 ft. for 1,250,000 cu. ft. Location is ½ mile southeast of Claude Carroll 1 Cornell discovery in 1940 for 1,200,000 cu. ft.

Carroll & Carroll 2 Government C NW NW 12-29n-12w
Drilling 1,092 ft.
Red Cactus Oil 1 Tribal.....SE SE SE 35-29n-18w
T.D. 900 ft., moving in heavier machine.

**Torrance County**

Cardinal Oil Co. 1 State.....SE SW 3-8n-14e
Drilling 400 ft.
Orville J. Lee 1 Milburn.....C NW SW 36-7n-7e
Rigging up.
J. P. Stewart 1 Laman..... C NW NE 3-3n-12e
T.D. 776 ft. in gray lime, fishing.

## UTAH

**Box Elder County**

Northern Oil 1..... NE SW 17-13n-4w
Resumed at 386 ft. and drilling ahead at 475 ft.

**Summit County**

Longwell Pet. Co. 1.....SE SW SE 35-3n-5e
Drilling 3,645 ft.

## Oklahoma Fields

*(Continued from Page 99)*

casing 1,054 ft., sand 1,072-76 ft., T.D. 1,151 ft.
Phillips 4 Warner, SW NE SE 17-7-17w, dry, T.D. 1,330 ft., show oil 1,325-30 ft.

**Lincoln County**

Laffoon field: Underwood 2 Thomas, NE SW 10-13-6, 14,000,000 cu. ft. gas, 1,050 lb. R.P., Hunton 4,148 ft., casing 4,130 ft., T.D. 4,150 ft., acid.
Kerlyn 1 Lynde, NW NE 15-13-6, 15,000,000 cu. ft. gas, Hunton 4,089-90 ft., casing 4,086 ft., T.D. 4,097 ft., acid.
Kerlyn 1 Tipken, NW NW 15-13-6, 18,000,000 cu. ft. gas, Hunton 4,100 ft., casing 4,100 ft., T.D. 4,112 ft., acid.
Harper-Turner 1 School land, E½ SE NW 16-13-6, 14,500,000 cu. ft. gas, Hunton 4,023 ft., casing 4,023 ft., T.D. 4,044 ft., acid.

**Marshall County**

South Isom Springs: Mellen 10 Cope, NE SW NE 1-8s-5e, pumped 1 bbl. of oil a day for 3 days, T.D. 603 ft.

**Noble County**

Polo pool: Stanolind 2 De Vore, NW SW NW 27-22-2w, old well P.B. from 4,913 ft. to 3,820 ft., acid 3,794-3,820 ft., pumped 18 bbl.

**Okfuskee County**

Dill pool: I. T. I. O. 4 Miller, SE NW SW 35-12-8, flowed 306 bbl., Cromwell 3,509 ft., casing 3,510 ft., T.D. 3,558 ft.
Weleetka pool: Shepard 1 Crow, SE NW NE 15-10-11, dry, T.D. 3,055 ft., water, P.B. 1,035 ft., 330,000 cu. ft. gas, sand 3,040 ft., casing 2,685 ft.

**Oklahoma County**

Oklahoma City: Thompson 1 Carey, W½ SE NW 34-12-3w, pumped 746 bbl., casing 6,407 ft., Simpson 6,400 ft., Wilcox 6,473 ft., T.D. 6,550 ft.

**Pontotoc County**

Allen pool: Sinclair Prairie 17 Ralls, SE SW SE 28-5-8, pumped 7 bbl., casing 733 ft., sand 732-58 ft., T.D. 760 ft., show oil, shot 746-50 ft.
Oakman pool: Mitchell 2 Skirvin, E½ SE SE 10-4-6, pumped 20 bbl., sand 757 ft., casing 758 ft., T.D. 772 ft., shot 765-70 ft.
Wildcat: Alma Norris, NE NW SW 22-4n-4e, dry, T.D. 2,978 ft., Wilcox 1,729 ft., Oil Creek 2,460 ft., Arbuckle 2,750 ft., perf. 1,320-30 ft. and 1,232-49 ft., H.F.W.

**Pottawatomie County**

Gray pool: Vierson 1 Greenlee, NE NW NW 35-6-4, dry, T.D. 3,678 ft., no show, Earlsboro 2,968-77 ft., show oil, casing 2,968 ft., test Earlsboro 1 bbl. oil.
St. Louis pool: Commercial 1 Bray, NE SE SE 6-7-4, flowed 240 bbl., pinched, Hunton 3,926 ft., casing 3,926 ft., T.D. 3,960 ft.
Smith 1 Brundage-B, NE SE 6-7-4, flowed 328 bbl., ¼-in. choke, Hunton 3,958-61 ft., casing 3,958 ft., T.D. 3,989 ft.
Wildcat: Kerlyn 1 Cherry, SE NE SW 32-8-5, pumped 172 bbl. oil and 74 bbl. water, Viola 4,195 ft., dense 4,240 ft., dolomite 4,290 ft., stain, T.D. 4,330 ft., P.B. 4,325 ft., acid.

**Stephens County**

Doyle pool: Clark 6 Payne, SE SW 2-1-5w, flowed 30 bbl., sand 3,870-80 ft., T.D. 4,330 ft., casing 3,977 ft., perf. 3,781-87 ft., P.B. 3,784 ft.
Empire pool: Stogner 3 Bush, NW NE SW 3-2s-8w, pumped 10 bbl., casing 1,538 ft., sand 1,538-54 ft., T.D., shot.

### OKLAHOMA DRILLING REPORT

**Caddo County**

Ray Stephens 1 Lankford ..... SE SE NW 6-6-9w
S.D. 5,470 ft.

**Cleveland County**

Luther Mayes et al 1 McCommins..NW NE NE 15-10-1
First report.

**Comanche County**

Hamblen-Good 1 Phillips ..... NE NE NW 34-1-13w
Drilling 441 ft., water sand.

**Creek County**

L. B. Jackson 1 Hannah Prince ... SE SE NE 26-19-9
Drilling 30 ft.

**Hughes County**

Magnolia 1 McKoy heirs ..... SW SW SE 16-5-11
T.D. 7,025 ft., electric log, P.B. 5,760 ft.

**Jackson County**

Mutual 1 Caves .. 600 ft. S, 25 ft. E, NW cor. 36-4-21w
Show oil 975 ft., drilling 1,082 ft.

**Jefferson County**

Hampton-Stelley 1 Pealor ..... NW NE NW 33-7s-6w
Drilling 1,280 ft.

**Kay County**

Union Natural 1 Long ..... NW NW NW 29-28-1
T.D. 3,705 ft., est. 75 bbl. a day, rerunning tubing to put on pump.
Continental 1 Cronan ..... NW NE SW 23-28-3
T.D. 3,176 ft., P.B. 3,099 ft., perf. 2,959-83 ft., no show, P.B. 2,976 ft., shot 2,965-75 ft., bailed 4½ bbl. oil and 5 gal. water, bailed dry.

**Love County**

Colvin & Hicks 2 Westheimer & Daube ..... W½ SE SW 27-6s-2e
T.D. 3,022 ft., acid, no results, S.D.

**Okfuskee County**

Burke-Greis 1 Mullins ..... SW SE SE 5-10-10
Shale 3,149-3,250 ft., show gas 3,059 ft., recovered ½ bailer oil an hr. and gas 3,075-80 ft. in sand, est. 500,000 cu. ft. gas at 3,131 ft., drilling 3,272 ft. in lime.
K.G.F.F. 1 Camp ..... SW SW SW 1-11-9
Drilling 417 ft.

**Oklahoma County**

Clyde Dorr et al 1 Riley ..... NE NE SE 34-13-1
Pawhuska 2,175 ft., drilling 3,290 ft.

**Osage County**

Superior Oil 1 Osage ..... NW SE SW 23-22-8
Show oil at 500 ft. in sand, drilling 710 ft.

**Pawnee County**

Dave Malernee 1-A Lucas ..... NW SE NW 28-21-8
Underreaming 21½-in. at 825 ft.

**Pottawatomie County**

Grisso & Eason 1 Rayster ..... SW NW NW 33-6-3
T.D. 3,753 ft., electric log, 4¾-in. casing 2,990 ft., P.B. 2,835 ft., to perf.
O'Conner & Townsend 2 Lynn.... NE NE NW 28-6-4
No Mayes, Woodford 3,210 ft., Hunton 3,467 ft., Sylvan 3,540 ft., Viola 3,588 ft., cored 3,607-26 ft. dry lime, coring 3,711 ft.
Hall & Jordan 1 Whitehead ..... W½ SE SW 36-10-3
First report.

**Seminole County**

Weldon Hall 1-A Jackson ..... N½ NE SE 14-7-7
At 3,186 ft. 1,000 ft. oil in hole, shot, T.D. 3,192 ft., pumped 81 bbl. in 13 hr., testing.
Alma 1 Borden ..... NE SE NW 4-8-8
T.D. 4,328 ft., P.B. 3,350 ft., P.B. 3,110 ft. to test Glicrease, drilled deeper to plug at 3,350 ft., perf. Cromwell 3,310-46 ft., flowed est. 5 bbl. oil and 5 bbl. salt water in 24 hr., testing.
Paul J. McIntyre 1 Brown ..... SW SE NE 14-9-7
Good show oil 1,900-20 ft. in Calvin zone, Senora 2,400-20 ft., Earlsboro 2,710-2,820 ft., good stain 2,780-2,820 ft., Booch 3,265-90 ft., good show oil or gas, Wapanucka 3,447 ft., Cromwell zone 3,451-3,570 ft., Mayes 3,910 ft., Woodford 4,010 ft., Misener 4,047-50 ft., show oil, Hunton 4,050 ft., stain and odor, 4,075-4,115 ft., Sylvan 4,165 ft., electric log to Viola 4,256 ft., T.D. 4,295 ft., run 7-in. casing.

**Stephens County**

Gulf 1 Krieger ..... E½ NE SW 3-2-5w
Dry sand 5,300-70 ft., drilling 5,404 ft. shale.
Skelly 4 Frensely.....NE NE 35-1s-5w
Woodford 3,990 ft., drilling 4,228 ft. shale.

**Tillman County**

Staley 1 Staley ..... SW SW NW 10-2s-19w
Washita dry 2,017-19 ft., S.D. 2,100 ft.

## AVERAGE DAILY PRODUCTION

### LEADING OKLAHOMA FIELDS

| | Feb. 22 | Feb. 15 |
|---|---|---|
| Allen | 4,850 | 4,875 |
| Billings | 6,250 | 6,300 |
| Burbank | 7,350 | 7,450 |
| South Burbank | 7,425 | 7,250 |
| Balance Osage | 17,250 | 17,200 |
| Blackwell district | 3,525 | 3,550 |
| Bristow-Slick | 6,475 | 6,500 |
| Chandler | 1,050 | 1,050 |
| Crescent | 2,050 | 2,250 |
| East Cromwell | 2,325 | 2,125 |
| Cromwell | 3,025 | 3,025 |
| Cumberland | 4,350 | 3,700 |
| Cushing-Shamrock | 9,025 | 9,050 |
| Duncan | 3,650 | 3,650 |
| Edmond | 3,750 | 3,850 |
| Fish | 2,900 | 2,950 |
| Fitts | 13,000 | 14,200 |
| Jesse | 1,850 | 1,950 |
| Graham-Fox | 2,250 | 2,275 |
| Gray | 950 | 950 |
| Healdton | 8,575 | 8,550 |
| Hewitt | 8,525 | 8,500 |
| Keokuk | 2,925 | 2,900 |
| Konawa | 1,050 | 1,025 |
| Lucien | 6,250 | 6,425 |
| Moore | 1,025 | 1,100 |
| Northeastern counties | 17,350 | 17,425 |
| Oklahoma City | 88,500 | 87,100 |
| Olympic | 1,825 | 1,825 |
| Ramsey | 3,500 | 3,500 |
| Sasakwa | 1,375 | 1,425 |
| Sholem-Alechem | 2,475 | 2,475 |
| Seminole district: | | |
| Bowlegs | 6,450 | 6,475 |
| Carr City | 2,200 | 2,175 |
| Dora | 1,550 | 1,550 |
| Earlsboro | 4,050 | 4,075 |
| East Earlsboro | 1,775 | 1,775 |
| South Earlsboro | 525 | 550 |
| Little River | 6,625 | 6,675 |
| East Little River | 675 | 675 |
| Mission | 1,300 | 1,300 |
| Seminole | 6,550 | 6,575 |
| East Seminole | 1,125 | 1,150 |
| Searight | 1,850 | 1,875 |
| Total Seminole | 34,675 | 34,850 |
| St. Louis-Pearson | 21,750 | 21,900 |
| Tatums-Tussy | 4,900 | 4,875 |
| Tonkawa-Garber-Thomas | 3,525 | 3,575 |
| Wewoka | 1,625 | 1,650 |
| Yale-Jennings | 3,225 | 3,200 |
| Total Oklahoma | 406,700 | 407,650 |

# Long Test to Be Used in Fixing Allowables

By VICTOR LAURISTON

CHATHAM, Ont., Feb. 24.—The revised schedule of allotments for Turner Valley crude producers for February shows a total, including war emergency production, of 720,095 bbl. for the month, compared with a previous tentative allotment of 728,000 bbl. This represents a reduction from 26,000 to 25,717 bbl. a day.

### New Testing Method

R. E. Allen, chairman of the Petroleum and Natural Gas Conservation Board for Alberta, has announced that the 6-hour flow test through 1-in. choke previously used to determine potential production of Turner Valley crude wells has been discontinued. Under the new system, newly completed producers will be cleared of spent acid and allowed to demonstrate their ability to produce steadily for a week. Prior to official test, wells will be shut in for a 24-hour gage of reservoir pressure or will be flowed at three sufficiently different rates to be representative of the well's range of production. Then the well will be put on production at such a rate as the operator may, at his own risk, elect, provided there is no excessive increase in the gas-oil ratio which would preclude continuous yield under the Oil and Gas Wells Act. During the first day of the production test the operator may adjust the control equipment; thereafter no changes are to be made for a period of not less than 7 and not more than 10 days. These tests will form the basis of future quotas.

### Turner Valley Lime Tests

North Turner Valley: Home Oil 1, LSD 8, 33-20-3w5, finished at 8,010 ft., flowed 75 bbl. an hour after acidizing and perforating in the two upper horizons of the lime. This was materially increased after 79 perforations and acid treatment in the lower zone. A very large well is expected. Home Oil 6, LSD 8, 28-20-3w5, finished at 8,446 ft., is the first well to be tested under the new conservation regulations, and looks like a fair producer.

West Central field: Royalite Oil 53, LSD 4, 19-19-2w5, finished at 7,668 ft., flowed at the rate of 30 bbl. an hour after acidizing with 5,000 gal. Testing and acidizing are being completed. Royalite 54, LSD 1, 7-19-2w5, finished at 7,367 ft., as acidizing and testing.

North Turney Valley: Royalite Oil 56, LSD 12, 14-20-3w5, spudding. Home Oil 9, LSD 9, 15-20-3w5, moving rig from No. 6 producer.

West Central Field: Allied Royalties 2, LSD 15, 6-19-2w5, location. Renown Royalties 1, LSD 8, 24-19-3w5, location.

### Steveville Field

Standard of British Columbia 3 Princess, LSD 5, 13-20-12w4, has spudded and is below 515 ft. with 13-in. casing set at 509 ft. Location is about ⅝ mile northwest of No. 2 discovery, and production is expected in the same horizon of the Madison limestone, around 3,500 ft. A 5,000-bbl. flow tank is being erected at No. 2 in preparation for extended tests to be started about the end of the month. The discovery well produced at the rate of 521 bbl. a day of 26.3-gravity crude with 12,750,000 cu. ft. of gas, production coming from the Madison limestone around 3,300 ft. It is planned to erect loading rack and lay a 1,500-ft. spur line to the Canadian Pacific Railway to handle production.

Steveville Oils 1, LSD 5, 18-20-11w4, is moving rotary outfit from Turner Valley. Location is ¾ mile east and ¼ mile south of the discovery. Anaconda Oil Co. has location for 1 Anaconda-Patricia in LSD 9, 31-20-12w4, about 5 miles northwest of the discovery. Pat Adams has the contract and is moving in rotary to spud early in March.

### Border Fields

Blood Indian Reserve: Northwest-West Petroleum 1, LSD 3, 20-5-23w4, is below 6,596 ft., 476 ft. in the Madison lime, and preparing for further drill-stem test. Earlier tests of the upper lime showed both water and oil. It will be deepened to the Devonian, which is expected around 7,600 ft.

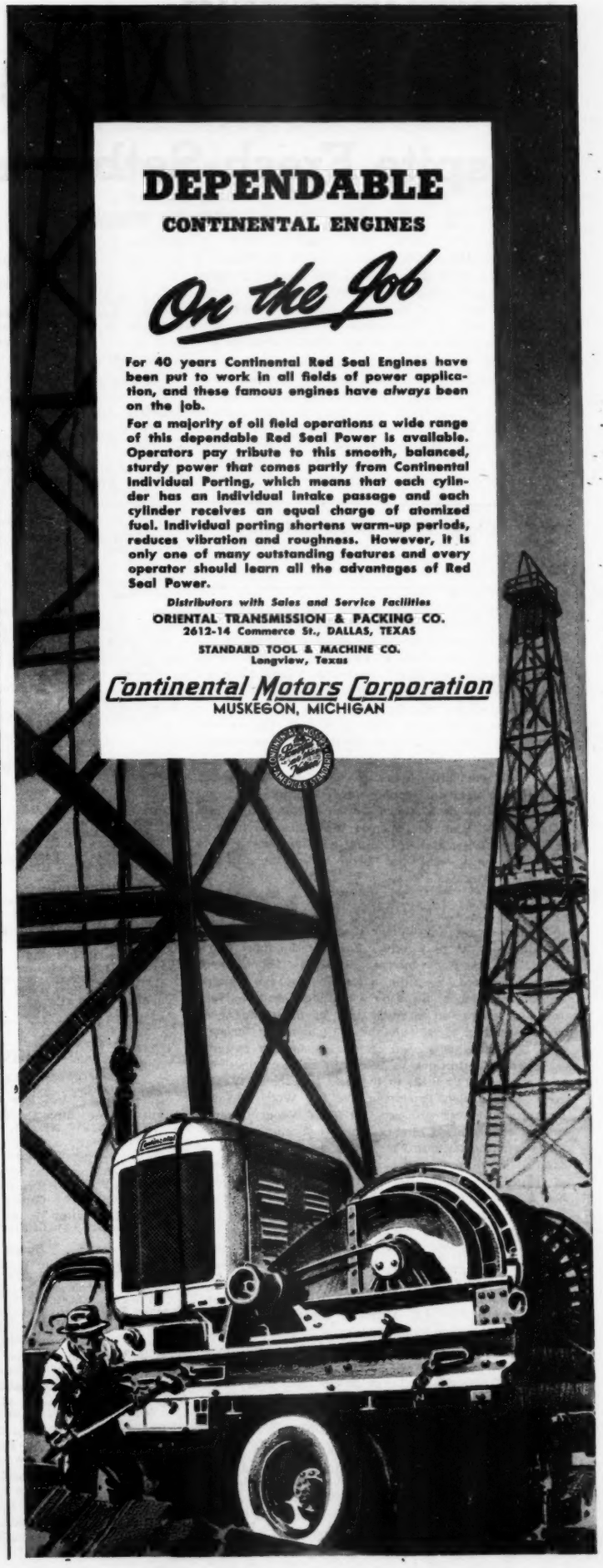
Lethbridge structure: Lethbridge Petroleums 1, LSD 12, 11-8-22w4, bottoming at 3,325 ft., is running casing to overcome caving.

Taber field: Border Petroleums 1, LSD 5, 32-19-17w4, bottoming at 3,480 ft., is being put on the pump.

### Athabaska Operations

Steady commercial production will start at the Abasand Oils plant at McMurray, in the Athabaska tar-sand area,

*(Continued on Page 135)*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# Wildcatting on Increase Despite Fresh Setbacks

By GEORGE WEBER

JACKSON, Miss., Feb. 24.—Interest in Mississippi is reviving, with an increase in the number of active wildcats, and development of new tests and prospects. Although results of two wildcat tests were disappointing last week, operations in Warren, Sharkey, Winston and Stone counties will hold interest for several weeks.

Following the test on Jones & Crosby 1 Allen, Attala County, A. E. Manning 1 McKelvain in Kemper County reported mud and fresh water on a drill-stem test of an oil show at 1,410-13 ft. Both tests are shut down, and the former may be retested if operators decide to squeeze and reperforate higher in that section. Neither test had geological nor geophysical background.

## SUMMARY OF COMPLETIONS

| | No. | Bbl. | Footage |
|---|---|---|---|
| Oil wells | 2 | 864 | 9,747 |

In Warren County, the Wilcox test of W. O. Allen is under way in the sidetracked hole of 1 Culley. The Davis Island test of Waggoner Brothers Oil Co. in the same county seems slated for early spudding, after several months of delay. Frame & Young have set surface casing on 1 Chancellor in Winston County, and it is reported that Ze Naw Oil Co. has taken over 1 Bromme from G. C. Koch in Copiah County and will resume operations from the shut-down total depth of 3,628 ft.

Leasing was active in Attala, Issequena, Wayne and Yazoo counties, and geophysical shooting continued most active in the southern sections of Mississippi and Alabama. To the east, Florida shows leasing interest in Dixie County, and in Georgia 241,000 acres are reported recently leased in Early, Miller, Decatur and Charlton counties.

### Tinsley

Three adverse developments showed in the Tinsley field during the past week. Possibly the most detrimental to operators' interests, because it could have been prevented, was the discarding of the 40-acre spacing pattern, in granting a drilling permit to Sanford & Sellers, on a road strip of about one-third acre, extending 35 ft. wide and 125 yards long through 19-10-2, already developed on 40-acre spacing pattern.

Apparent definitions to Woodruff sand productivity resulted from two wells in the field last week. On the west edge, Union Producing Co. 1-A Woodruff, offsetting a producer with over 70 ft. of Woodruff sand, missed that section, and at the week end was bottomed at 4,920 ft., with 7-in. casing set above the Perry sand at 4,889 ft. for an early test. In the north end of the field, Slick-Urschel Oil Co. 14 Slick estate also had a poor Woodruff showing, and may define it in that direction. Meanwhile, extension continues on the south and southeast, with edge tests continuing to be staked and drilled. The surprise failure of the Union west-edge test to get the Woodruff leaves prospects in that area of the structure in doubt.

Production at Tinsley rose sharply last week, averaging over 20,000 bbl. Although considerably below the estimated potential production of 53,000 bbl. daily, the fields output exceeds its regular market, and much crude is going to storage, to be later sold in large volumes at presumably lower prices than those paid for current production.

### MISSISSIPPI COMPLETIONS

**Tinsley—Yazoo County**

Union Prod. Co. 2 Childress-Jones unit SE SE 24-10-3 366 bbl., ¼-in. choke, T.P. 110 lb., C.P. 150 lb., 7-in. casing 5,089 ft., perf. 5,018-42 ft., Woodruff 4,975-5,043 ft., T.D. 5,096 ft.

Union Prod. Co. 1 V. M. Perry.....SE SE 23-10-3 498 bbl., 24/64-in. choke, T.D. 50 lb., C.P. 110 lb., 7-in. casing 4,644 ft., perf. 4,586-4,606 ft., Woodruff 4,588-4,606 ft., T.D. 4,651 ft.

### MISSISSIPPI DRILLING REPORT

**Attala County**

Clint Crosby 1 Allen..... SW SW 33-13-5
Perf. 4,018½-21 ft., hole filled with 3,500 ft. salt water in 1 hr., may squeeze and perf. higher.

**Clarke County**

Walsingham & Earles 1 School Land..... SW NW NE 16-4n-15e
Drilling 3,256 ft.

**Copiah County**

Ze Naw Oil Co. (former G. C. Koch) 1 Broome.... SW SW SE 1-9n-8e
T.D. 3,628 ft., prep. resume operations.

**Kemper County**

A. E. Manning 1 McKelvain.....NE SE 2-9n-17e
T.D. 1,475 ft., show oil 1,410-13 ft., D.S. test 1,377-1,415 ft. recovered 1,180 ft. mud and fresh water in 30 minutes, S.D.

**Noxubee County**

Fred Stewart 1 Donahoo .....NW 25-16-17
Washing to bottom 2,165 ft.

**Stone County**

H. I. Morgan 2 Dantzler Lumber Co...NE SE 4-4s-10w
Drilling 1,435 ft.

**Warren County**

W. O. Allen 1 J. W. Culley.....SE NW 6-13n-3e
Set plug 2,626 ft., drilling out into new hole to T.D. 2,880 ft., twisted drill stem.
Waggoner Bros. Oil Co. 1 Parker....NW NW 17-14n-1e
Moving in material.

**Winston County**

Frame & Young 1 H. C. Chancellor.....NE 9-13n-14e
Set surface casing, waiting on cement.

## Illinois Fields

(Continued from Page 116)

Horton & Wiggins 1 J. G. Bradley SE SE NW 32-6s-10e
Glen Dean 2,426 ft., Hardinsburg 2,484 ft., Golconda 2,555 ft., Barlow 2,651 ft., Cypress sand 2,660-70 ft., show oil, Benoist 2,834 ft., Aux Vases 2,934-56 ft., show oil, Ste. Genevieve 2,961 ft., T.D. 2,980 ft.
Brehm & Darlen 1 Creek ..... SW NW NW 29-6s-10e
Drilling 2,890 ft.
Eason 1 DeLaff ..... NE SW NW 8-7s-8e
Cypress sand 2,682-2,703 ft., Paint Creek sand 2,767-89 ft., S.D. 3,195 ft.

**Williamson County**

G. R. Hays 1 Arnold ..... SW NW NW 23-10s-4e
Drilling 470 ft.
Adkins 1-D Old Ben Coal ..... SE SE SE 4-8s-2e
Kincaid 1,385 ft., Palestine 1,530 ft., Menard 1,660 ft., Menard lime 1,680 ft., slight show oil 1,550 ft., drilling 1,765 ft.

## Michigan Fields

(Continued from Page 120)

**Bay County**

Monitor Township: United Drillers & Producers 1 Kircher, SW NE NE 3-14n-4e, 64 bbl., acid, T.D. 2,887 ft.

**Clare County**

Winterfield Township: Sun B-1 State-Winterfield, N½ NW SW 36-20n-6w, 240 bbl., naturally, 3,791 ft.

**Gratiot County**

Sumner Township: W. E. Ross 1 Wanamaker, C SE 31-11n-4w, 8,340,000 cu. ft. natural gas, T.D. 980 ft.

**Huron County**

Bloomfield Township: Wallace Markle 1 Johnston, SE SE SW 8-17n-14e, dry, T.D. 3,422 ft.
Cryden Petroleum Co. 1 McIntyre, SW SW SW 16-17n-14e, T.D. 2,762 ft.
Dwight Township: Gordon Walker 1 Hellems, SW NE SE 17-17n-13e, dry, T.D. 3,020 ft.

**Isabella County**

Vernon Township: Lupher Drilling Co. B-1 Bowman, SE SE NE 27-16n-4w, dry, T.D. 3,850 ft.

**Kalkaska County**

Cold Springs Township: Monarch Development Co. 2 Iron Co., C NW 21-28n-6w, dry, T.D. 1,847 ft.

**Kent County**

Byron Township: C. A. Perry 1 Michigan Trust Co., SE NE SE 33-5n-12w, dry, T.D. 1,710 ft.

**Midland County**

Porter Township: Pure 38 Narmore, N½ SE NE 16-13n-1w, 151 bbl., acid, T.D. 3,406 ft.

**Montcalm County**

Richland Township: Belvidere Oil Co. 1 Hartman, SW SE SE 6-12n-5w, dry, T.D. 1,338 ft.

**Oceana County**

Otto Township: Muskegon Development Co. 1 Swett, NE SW SE 23-13n-16w, dry, T.D. 1,975 ft.

**Ottawa County**

Tallmadge Township: Daily Crude Oil Co. 1 Powell, NE NW NW 7-7n-13w, dry, T.D. 1,904 ft.
C. A. Welsh 1 Carlson, NW SE NE 33-7n-13w, 10 bbl., acid, T.D. 1,814 ft.
H. C. Williams 1 Gavin, SW NE NE 33-7n-13w, 50 bbl., acid, T.D. 1,847 ft.
Smith Petroleum Co. 6 Fenske, SE NE NW 34-7n-13w, 60 bbl., acid, T.D. 1,869 ft.

**St. Joseph County**

Lockport Township: O. A. Avery 1 Dunnworth, SW NE SW 13-6s-11w, dry, T.D. 2,693 ft.

**Van Buren County**

Bloomingdale Township: Clapsaddle & Harris 1 Canute, SE SW SW 10-1s-14w, 150 bbl., acid, T.D. 1,280 ft.

## Appalachian Fields

(Continued from Page 117)

ing 5,111 ft. Both will be deepened, gaged before shot.
Hays Oil & Gas Co. 1 C. A. Harper, spudding.
Columbian Carbon Co. 1 Shelby, T. Jones, spudding.
United Fuel 5004 A. B. Jones, rigging up.
No completions in Jackson County.

## SOUTHWEST PENNSYLVANIA

On Chestnut Ridge in South Union Township, Fayette County, the discovery well on this structure drilled by New Penn Development Co., William E. Snee et al on the Summit Hotel property (Heyn) was shot through the Oriskany sand after producing from the Onondaga chert beds and later the Oriskany sand. The shot made no improvement in the volume which continues at about 1,500,000 cu. ft. a day.

Here Peoples Natural Gas Co. are evidently meeting with little success in 3 Piedmont Coal Co. which topped the Oriskany sand at 7,087 ft. and at 7,117 ft. or 30 ft. in have a gage of only 40,000 cu. ft. a day. This test was unusual because of the very small showing of gas in the Onondaga and the extra thickness of that member. It will be deepened and probably shot. This company's 4 Piedmont Coal Co. is drilling at 3,335 ft.

New Penn Development Co. et al topped the Onondaga chert at 6,395 ft. in 3 Summit Hotel (Heyn) and shut down for casing. The top of the Onondaga is set at 6,365 ft. This places it high on structure.

In Maryland, these operators will resume work in the wildcat on the Humberson farm on the Accident dome in Garrett County which was halted by a crooked hole so bad that tool action was stopped. A string of casing will be run and hung after a whipstock has been set.

**Armstrong County**

Burrell Township: Equitable 1 James & Mary Fiscus, 70,000 cu. ft. gas, Bradford sand, T.D. 3,528 ft.
T. W. Phillips 1 S. Wagley, dry, T.D. 2,387 ft.
Cowanshannock Township: Shelocta 1 Park Rearick, 43,000 cu. ft. gas, Murraysville and Hundred-foot sands, T.D. 3,556 ft.
Kittanning Township: Equitable 1 Mary Stitt, drilled deeper, dry, through Bradford, T.D. 3,555 ft.
Plum Creek Township: Shelocta 1 Harry Kough, 40,000 cu. ft. gas, Murraysville, Hundred-foot, Speechley and Bradford sands, T.D. 4,144 ft.
South Buffalo Township: Pleasant Valley Gas Co. 1 C. J. Stepp, 231,000 cu. ft. gas, Hundred-foot and Speechley sands, T.D. 2,652 ft.

**Greene County**

Monongahela Township: H. B. Scott et al 1 Silas Provins, 535,000 cu. ft. gas, Big Injun sand, 1,374 ft., gas 1,394 ft. and 1,414 ft., T.D. 1,420 ft.
Greensboro Gas Co. 1 Charles Hopton, 93,000 cu. ft. gas, Elizabeth sand 2,993-3,028 ft., gas 3,009-13 ft., T.D. 3,118 ft.
Richhill Township: Manufacturers 1 William Hughes, dry, through Elizabeth sand, T.D. 3,495 ft.

**Indiana County**

North Mahoning Township: John Wray et al 1 Floyd Stear, 30,000 cu. ft. gas, Bradford sand, T.D. 3,252 ft.

**Washington County**

Morris Township: Carnegie 1 Nelan heirs, 421,000 cu. ft. gas, Big Injun sand 1,928 ft., gas 1,933 ft., T.D. 1,952 ft. This is the second well in a recently discovered Injun sand lens.

**Westmoreland County**

Bell Township: Peoples 1 Pearl Elwood, 16,000 cu. ft. gas, Bradford sand, T.D. 3,696 ft.

### DRILLING

**Armstrong County**

Boggs Township: John Wray et al 3 Ralph Williamson, 2,150 ft.
Plum Creek Township: Peoples 2 W. J. Boyer, 2,406 ft.
James Wright 1 fee, 1,600 ft., casing.

**Greene County**

Dunkard Township: Donley & Lough 1 Litman heirs, 2,700 ft.
Monongahela Township: Equitable 1 William Hart, rigging up.
H. B. Scott et al 1 Andrew Kovack, Big Injun sand 1,297 ft., gas gaging 63,000 cu. ft. at 1,349 ft., testing.
Greensboro Gas Co. 1 Longenecker heirs, 1,559 ft.
D. E. Mayne et al 1 Andrew Kovack, 1,000 ft.

# MARKET RECORD OF ACTIVE OIL STOCKS . . .

Compiled by Carl H. Pforzheimer & Co., 25 Broad Street, New York City, Member New York Stock Exchange and New York Curb Exchange

## New York Stock Exchange

| 1941 High | 1941 Low | Week ended Feb. 22 High | Week ended Feb. 22 Low | Week ended Feb. 22 Close | Stocks— | Total shares outstanding | Par value | Latest dividend | Payable or last paid | Dividends paid in 1940 | Com. sh. earn. 1939 | Com. sh. earn. 1938 | 1940 High | 1940 Low | 1939 High | 1939 Low |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 50⅜ | 44 | 45 | 44½ | 44½ | Amerada Corp. | 788,675 | N.P. | 50cQ | 1-31-41 | $2.00 | $1.56 | $2.07 | 58½ | 38½ | 74½ | 50 |
| 24¼ | 20¾ | 22 | 20¾ | 21¼ | Atlantic Refining | 2,663,999 | $25 | 25cQ | 3-15-41 | 1.00 | 1.66 | 1.40 | 27⅛ | 18¼ | 24¾ | 18⅛ |
| 10½ | 8 | 8⅜ | 8⅛ | 8⅜ | Barber Asphalt Co. | 390,223 | $10 | 25c | 5-21-40 | .50 | 1.39 | —.85 | 16⅝ | 8½ | 21 | 10¼ |
| 9⅝ | 7⅝ | 8⅛ | 7⅝ | 8 | Barnsdall Oil Co. | 2,558,779 | $5 | 15c | 3-10-41 | .60 | .76 | 1.26 | 13⅜ | 7⅛ | 19½ | 11⅛ |
| 6 | 5⅜ | 5½ | 5⅜ | 5½ | Consolidated Oil Corp. | 13,751,726 | N.P. | 12½cQ | 2-15-41 | .72½ | .55 | .55 | 8⅛ | 5½ | 9⅞ | 6½ |
| 20½ | 17½ | 18½ | 17½ | 17⅝ | Continental Oil of Delaware | 4,682,572 | $5 | 25cQ | 12-23-40 | 1.00 | 1.35 | 1.10 | 25 | 16⅛ | 31½ | 19⅞ |
| 4½ | 3½ | 3¾ | 3½ | 3¾ | Houston Oil | 1,098,618 | $25 | .... | 10-17-30 | .... | .43 | .83 | 6⅞ | 3⅜ | 9⅜ | 4½ |
| 11⅜ | 9¾ | 10 | 9¾ | 9¾ | Lion Oil Refining | 435,815 | N.P. | 25cQ | 12-31-40 | 1.00 | 1.50 | 2.09 | 14⅜ | 9 | 18⅛ | 10 |
| 15½ | 13⅜ | 14⅜ | 13⅜ | 13¾ | Mid-Continent Petroleum | 1,857,912 | $10 | 40c | 12-2-40 | .80 | 1.42 | .56 | 17⅜ | 11½ | 18 | 11⅛ |
| 11 | 9⅜ | 9¾ | 9½ | 9½ | Mission Corporation | 1,378,645 | $10 | 25c | 12-20-40 | .25 | .87 | 1.04 | 11¾ | 7⅛ | 14⅞ | 8¾ |
| 6⅝ | 4⅞ | 5¼ | 4⅞ | 5⅛ | National Supply | 1,155,517 | $10 | .... | 12-22-37 | .... | —.87 | —.79 | 9¾ | 4⅝ | 15½ | 5⅝ |
| 7⅞ | 6¾ | 7 | 6¾ | 7 | Ohio Oil Co. | 6,563,377 | N.P. | 25c | 12-14-40 | .... | —.10 | .25 | 8¾ | 5⅜ | 10½ | 6 |
| 7⅛ | 5½ | 5½ | 5½ | 5½ | Pacific Western Oil | 1,000,000 | N.P. | 40c | 12-19-39 | .... | .81 | 1.22 | 8⅞ | 5½ | 11⅞ | 7 |
| 8½ | 7¼ | .. | .. | .. | Pan American Pet. Trans. | 4,702,945 | $5 | 25c | 12-21-40 | .25 | 1.10 | .08 | 10½ | 6¾ | 8¾ | 5 |
| 41¼ | 35¾ | 36½ | 35¾ | 36⅛ | Phillips Petroleum | 4,449,052 | N.P. | 50cQ | 3-1-41 | 2.00 | 2.21 | 2.03 | 41¾ | 27⅛ | 46½ | 31¼ |
| 16⅞ | 14¾ | 14¾ | 14¾ | 14¾ | Plymouth Oil Co. | 1,038,633 | $5 | 25c‡ | 12-23-40 | ‡1.30 | 2.38 | 2.59 | 22¾ | 15 | 24 | 17⅛ |
| 8⅞ | 7 | 7⅝ | 7¼ | 7⅜ | Pure Oil Co. | 3,982,031 | N.P. | 25c | 12-20-40 | .25 | 1.11 | .38 | 11½ | 6¾ | 11¾ | 6⅛ |
| 9 | 7¼ | 8 | 7⅜ | 8 | Richfield Oil Corp. | 4,010,000 | N.P. | 50c | 12-21-40 | .50 | .65 | .51 | 9¼ | 5⅞ | 10¼ | 6⅝ |
| 15⅜ | 12¾ | 13¼ | 12¾ | 12¾ | Seaboard Oil of Delaware | 1,244,383 | N.P. | 25cQ | 3-15-41 | 1.00 | 1.40 | 1.52 | 20 | 11 | 24⅜ | 15½ |
| 12⅜ | 10⅛ | 11½ | 10¾ | 11½ | Shell Union Oil | 13,070,625 | N.P. | 50c | 12-20-40 | .75 | .77 | .72 | 13⅛ | 7⅜ | 17¼ | 9⅞ |
| 22⅜ | 18⅞ | 19⅝ | 18⅞ | 18⅞ | Skelly Oil | 995,349 | $15 | 50c | 12-20-40 | 1.25 | 1.99 | 2.27 | 23¼ | 12¼ | 29½ | 15½ |
| 9¼ | 8½ | 8⅞ | 8½ | 8½ | Socony-Vacuum | 31,206,071 | $15 | 25cSA | 3-15-41 | .50 | 1.10 | 1.29 | 12½ | 7⅛ | 15⅛ | 10¼ |
| 20¾ | 18 | 18¾ | 18 | 18⅜ | Standard Oil of California | 13,003,953 | N.P. | 25cQ | 3-15-41 | 1.00 | 1.38 | 2.22 | 26⅛ | 16¼ | 33⅝ | 24¼ |
| 27⅞ | 25¾ | 26 | 25⅝ | 26 | Standard Oil (Indiana) | 15,272,020 | $25 | 25c | 3-15-41 | 1.50 | 2.23 | 1.82 | 29 | 20¾ | 30 | 22¾ |
| 36½ | 33 | 34¼ | 33 | 34 | Standard Oil of New Jersey | 27,280,998 | $25 | 75c† | 12-16-40 | 1.75 | 3.26 | 2.86 | 46½ | 29⅞ | 53½ | 38 |
| 58¾ | 54¼ | 55 | 54¾ | 55 | Standard Oil of Ohio | 753,740 | $25 | 37½c | 3-15-41 | 2.00 | 6.64 | 1.81 | 41¾ | 26¼ | 32¾ | 17 |
| 1¾ | 1½ | 1⅝ | 1½ | 1⅝ | Sun Oil | 2,434,863 | N.P. | 25cQ§ | 3-15-41 | *1.00 | 2.74 | 1.07 | 65⅞ | 46¾ | 66 | 45¾ |
| 40¼ | 34½ | 35⅞ | 34½ | 35½ | Superior Oil Corp. | 1,388,979 | $1 | 10c | 12-28-40 | .10 | .04 | .24 | 2½ | 1⅛ | 3⅝ | 1⅜ |
| 3⅜ | 2⅞ | 3 | 2⅞ | 3 | Texas Corp. | 10,876,139 | $25 | 50cQ | 4-1-41 | 2.00 | 3.02 | 2.13 | 47⅝ | 33 | 50¾ | 32½ |
| 6 | 5⅜ | 5⅝ | 5⅜ | 5⅝ | Texas Gulf Producing Co. | 888,147 | N.P. | 10c | 12-14-40 | .20 | .69 | .86 | 4¼ | 2½ | 5¾ | 3¼ |
| 10⅜ | 9½ | 9¾ | 9½ | 9½ | Texas Pacific Coal & Oil | 888,236 | $10 | 10c | 3-1-41 | .40 | 1.00 | 1.16 | 8⅝ | 5⅜ | 11⅜ | 7 |
| 14½ | 12¾ | 13½ | 13⅛ | 13½ | Tide Water Associated | 6,371,827 | $10 | 15c | 3-3-41 | .70 | 1.05 | 1.28 | 12 | 8¾ | 14¼ | 9½ |
| 29¾ | 25⅝ | 27 | 25⅝ | 27 | Union Oil Co. of California | 4,666,270 | $25 | 25c | 2-15-41 | 1.00 | 1.25 | 1.47 | 17½ | 12 | 19¾ | 15⅛ |
| 1⅞ | 1⅝ | 1⅝ | 1⅝ | 1⅝ | Union Tank Car Co. | 1,177,381 | N.P. | 50c | 3-3-41 | 1.75 | 2.07 | 1.16 | 29⅞ | 22¾ | 24¼ | 20⅛ |
| 40½ | 34¼ | 34¾ | 34¼ | 34¾ | Wilcox Oil & Gas | 470,768 | $5 | 10c | 2-15-40 | .... | .77 | .52 | 3⅝ | 1¾ | 4¼ | 2⅜ |

*Also 5 per cent in stock. †Includes extras. ‡Also 2 per cent in stock. §Also 6 per cent in stock. —Deficit.

## New York Curb Exchange

| 1941 High | 1941 Low | Week ended Feb. 22 High | Week ended Feb. 22 Low | Week ended Feb. 22 Close | Stocks— | Total shares outstanding | Par value | Latest dividend | Payable or last paid | Dividends paid in 1940 | Com. sh. earn. 1939 | Com. sh. earn. 1938 | 1940 High | 1940 Low | 1939 High | 1939 Low |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7 | 5⅛ | 5½ | 5⅜ | 5⅜ | American Republics Corp. | 1,308,049 | $10 | 25c | 12-18-40 | .... | $0.14 | —$0.22 | 10¾ | 4½ | 11¾ | 5½ |
| 1¾ | 1⅜ | 1⅜ | 1⅜ | 1⅜ | Bridgeport Machine Co. | 263,700 | N.P. | $1.25 | 12-30-37 | .... | —.95 | —.14 | 3¼ | 1⅜ | 7¼ | 2½ |
| 40¼ | 38 | 39½ | 38 | 39½ | Buckeye Pipe Line Co. | 200,000 | $50 | $1 | 3-15-41 | $4.00 | 3.13 | 2.36 | 43 | 28 | 34¾ | 26½ |
| 110¼ | 106 | .. | .. | .. | Chesebrough Mfg. Co. | 120,000 | $25 | $1.50Q† | 3-31-41 | 6.00 | 7.87 | 5.32 | 117 | 95 | 130 | 108⅝ |
| 5⅛ | 3¾ | 4¼ | 3¾ | 4¼ | Cities Service (new) | 3,703,978 | $10 | .... | 6-1-32 | .... | .68 | .23 | 6¾ | 4 | 9¼ | 4¼ |
| ⅞ | ⅝ | ⅝ | ⅝ | ⅝ | Cosden Petroleum | 465,332 | $1 | .... | ..... | .... | .... | .... | 2⅛ | ⅝ | 2¼ | ½ |
| 15¼ | 13 | 13¼ | 13 | 13¼ | Creole Petroleum | 6,974,356 | $5 | 50cSA† | 12-16-40 | 1.00 | 1.38 | 1.64 | 24¼ | 11⅝ | 28 | 16¾ |
| 4¼ | 3¾ | 3¾ | 3¾ | 3¾ | Darby Petroleum | 351,390 | $5 | 25cSA | 1-15-39 | .... | .03 | .69 | 4⅜ | 2⅞ | 7⅛ | 3⅝ |
| 1⅛ | 1 | 1 | 1 | 1 | Derby Oil & Refining | 263,162 | N.P. | .... | ..... | .... | —.37 | —.91 | 2 | ¾ | 2⅝ | 1½ |
| 28⅜ | 21½ | .. | .. | .. | Eureka Pipe Line | 50,000 | $50 | $3.50† | 2-1-41 | 2.25 | .63 | —.37 | 31 | 20¼ | 23 | 15⅛ |
| 33½ | 31 | 31⅝ | 31 | 31⅝ | Gulf Oil Corp. | 9,076,202 | $25 | 25cQ | 12-27-40 | 1.25 | 1.69 | 1.43 | 39⅞ | 25⅛ | 45⅛ | 29¼ |
| 63 | 54 | 55 | 54 | 54½ | Humble Oil & Refining | 8,987,840 | N.P. | 37½c | 4-1-41 | 2.00 | 3.33 | 3.98 | 68 | 47⅛ | 71 | 52½ |
| 6⅞ | 5¾ | 6⅜ | 6⅛ | 6⅛ | Imperial Oil of Canada | 26,965,078 | N.P. | 25c | 12-2-40 | .62½ | .71 | .96 | 12⅜ | 5⅜ | 17 | 11⅜ |
| 3⅞ | 3⅜ | 3½ | 3½ | 3½ | Indiana Pipe Line | 300,000 | $7.50 | 20c | 11-15-40 | *2.80 | .33 | .47 | 7⅜ | 3 | 7¼ | 5½ |
| 10⅜ | 8⅞ | 9½ | 9¼ | 9½ | International Petroleum | 14,324,088 | N.P. | 30c | 12-21-40 | 1.25 | 1.19 | 1.98 | 10⅜ | 8¼ | 27½ | 17 |
| 2⅝ | 1¾ | 2⅝ | 2½ | 2½ | Kirby Petroleum Co. | 500,000 | $1 | 10c | 4-15-38 | .... | .06 | .14 | 2¾ | 1⅝ | 3¾ | 2⅛ |
| 10⅛ | 9⅜ | 9⅞ | 9½ | 9⅞ | Lone Star Gas | 5,518,347 | N.P. | 30c | 12-21-40 | .70 | .98 | .88 | 10¾ | 7⅜ | 10½ | 7⅛ |
| 4⅝ | 4⅛ | 4⅛ | 4⅛ | 4⅛ | Louisiana Land & Exp. | 2,966,762 | $1 | 10c | 3-15-41 | .35 | .22 | .45 | 6¼ | 3¾ | 7¾ | 4 |
| 10 | 9½ | .. | .. | .. | Margay Oil Corp. | 149,943 | N.P. | 25cQ | 1-10-41 | 1.00 | 1.52 | 2.28 | 17 | 9¼ | 17 | 14½ |
| 8 | 7⅛ | 7⅛ | 7⅛ | 7⅛ | Midwest Oil Co. | 998,474 | $10 | 45c | 12-16-40 | .90 | .99 | .93 | 8½ | 6½ | 8¾ | 6⅝ |
| 5¾ | 5⅛ | 5¼ | 5¼ | 5¼ | Mountain Producers | 1,593,584 | $10 | 30cSA | 12-16-40 | .60 | .70 | .62 | 6¼ | 4⅞ | 6 | 4⅞ |
| 12⅜ | 11 | 12 | 11¼ | 11½ | National Fuel Gas | 3,810,183 | N.P. | 25cQ | 1-15-31 | 1.00 | .95 | .84 | 13⅛ | 10 | 14 | 11¼ |
| 12¾ | 10¼ | 10⅜ | 10⅝ | 10⅝ | National Transit | 509,000 | $12.50 | 50c | 12-16-40 | 1.00 | .91 | .88 | 12½ | 8¾ | 9½ | 7¼ |
| 1⅛ | 1 | 1 | 1 | 1 | New Mexico and Arizona | 1,000,000 | $1 | 1c | 12-1-37 | .... | .02 | .02 | 1¼ | ¾ | 1⅜ | 1 |
| 7¼ | 6⅝ | 7¼ | 7 | 7 | New York Transit | 100,000 | $5 | 25c | 9-20-40 | .60 | .88 | .16 | 7⅜ | 5¼ | 6 | 4 |
| 9¾ | 8¼ | .. | .. | .. | Northern Pipe Line | 120,000 | $10 | 40c | 12-2-40 | .80 | .31 | .24 | 9⅞ | 6 | 7 | 4½ |
| 3¼ | 2⅝ | 2⅞ | 2⅝ | 2⅞ | Pantepec Oil | 2,856,872 | $1 | .... | ..... | .... | .... | .... | 5½ | 2½ | 7⅝ | 4 |
| 1½ | 1 | .. | .. | .. | Root Petroleum Co. | 336,045 | $1 | 25c | 2-1-37 | .... | .70 | .17 | 3¼ | 1 | 5 | 1¼ |
| 2½ | 2⅛ | 2⅜ | 2⅜ | 2⅜ | Ryan Consolidated | 298,931 | N.P. | 10c | 12-28-40 | .... | .16 | .29 | 3 | 1½ | 3 | 1⅞ |
| 8 | 7 | 7 | 7 | 7 | Southern Pipe Line | 100,000 | $10 | 25c | 3-3-41 | .50 | .25 | —.27 | 11¾ | 4¾ | 4⅞ | 3½ |
| 39¾ | 37½ | 37½ | 37½ | 37½ | South Penn Oil | 1,000,000 | $25 | $1.87½† | 12-20-40 | 2.50 | 2.84 | 1.44 | 44 | 28 | 40½ | 26¾ |
| 30½ | 24½ | .. | .. | .. | Southwest Penna. Pipe Lines | 35,000 | $50 | 50c | 12-26-40 | 6.50 | 2.06 | —.41 | 35 | 21 | 23 | 18 |
| 20⅜ | 18 | 18⅜ | 18 | 18¼ | Standard Oil of Kentucky | 2,604,790 | $10 | 25c | 3-15-41 | 1.30 | 1.53 | 1.45 | 20⅞ | 16½ | 20⅛ | 17¼ |
| 1⅝ | 1⅜ | 1½ | 1⅜ | 1½ | Sunray Oil | 1,975,876 | $1 | 5c | 12-20-40 | .10 | .25 | .23 | 2 | 1⅜ | 2⅝ | 1⅜ |
| 3 | 2¾ | 2⅞ | 2⅞ | 2⅞ | Texon Oil & Land | 936,024 | $2 | 10c | 12-30-40 | .40 | .49 | .56 | 3⅛ | 2 | 4 | 2⅝ |
| 2½ | 2¼ | 2¼ | 2¼ | 2¼ | Transwestern Oil Co. | 750,000 | $10 | .... | ..... | .... | —1.42 | .12 | 3⅜ | 2 | 6 | 2½ |
| ⅛ | ⅝ | ¾ | ⅝ | ⅝ | United Gas Corp. | 7,818,959 | $1 | .... | ..... | ... | —.55 | —.51 | 2⅛ | ¾ | 3⅜ | 1½ |

*Includes $2.50 capital distribution. †Includes extras. —Deficit.

# Personal Paragraphs

JOHN BEMAN has been named president of the Pennzoil Co. of California, to succeed Norman Day, who died recently. Mr. Beman is widely known not only in the petroleum industry, but also in statewide legal, educational and business circles. A native of Colorado, he moved to California at an early age, and was graduated from Stanford University in 1912. As a member of an informal legislative council composed of representatives of major oil companies and oil consumers on the Pacific Coast, he has been instrumental in framing much constructive state, county and city legislation affecting the oil industry's refining and retailing. Mr. Beman is a member of the law firm of Fogel & Beman, and his new position will not affect the status of his law partnership, as he will remain as an active partner.

C. E. BUCKNER, vice president, W. C. McBride, Inc., has been ill at his home in St. Louis, Mo., for some time.

L. B. HICKS, production engineer in the Bartlesville, Okla., office of Cities Service Oil Co., has been transferred to Great Bend, Kans., as district production engineer for western Kansas.

B. A. HARDEY was elected chairman, and J. W. SMITHER was named vice chairman of the newly organized Board of Minerals, governing body of the Department of Minerals, State of Louisiana.

PAUL BENEDUM TREES, scout for Gulf Oil Corp. in the Illinois basin, is scheduled to return in a few days to Mount Vernon, Ill., where he and his bride, the former Harriette Decker Fager, will make their home after completing a wedding trip through southern states.

JOHN D. GILL, a director of Atlantic Refining Co., Philadelphia, Pa.; H. A. METZGER, Standard Oil Co. of New Jersey, New York, and GUSTAV EGLOFF, director of research of Universal Oil Products Co., Chicago, Ill., will represent the oil industry on a "tour of industrial exploration" in South America. The tour will start in March under sponsorship of the National Research Council.

M. L. ATKINSON, production superintendent for the Phillips Petroleum Co., West Texas district, has again been named chairman of the Little International Oil Show to be held in Odessa, Tex., on June 21 and 22 of this year.

J. S. COSDEN, JR., president of Cosco Oil Co., and said to be one of the oil industry's youngest chief executives, has been making a tour of the Southwest, visiting Santa Fe, N. M., and Amarillo and Fort Worth, Tex. Mr. Cosden's headquarters are at Wynnewood, Okla.

WILLIAM E. McDONALD, heretofore division manager of Shell Oil at Oakland, Calif., has been transferred to Portland, Ore., in the same capacity and GEORGE V. BIRKINSHAW, in charge of light-oil sales in the head office, has succeeded Mr. McDonald as division manager at Oakland.

M. J. RATHBONE, president of Standard Oil Co. of Louisiana, has been reappointed to the Department of Commerce and Industry Board for the State of Louisiana.

FRED R. SCHROEDER, of Shreveport, La., has been promoted to the position of superintendent of the geological department of Union Producing Co., an associated company of United Gas Pipe Line Co.

Mr. Schroeder, a graduate of the University of Illinois, first started working for Union in 1930 as a geological scout. He worked in this capacity in the East Texas field during its boom years, 1930 through 1934, coming to Shreveport at the end of that time. In 1937 he was transferred to the general offices in Houston, returning to Shreveport in February 1940, when the general offices of United Gas Pipe Line and its associated companies were moved to that city.

CHARLES I. FRANCIS has been reappointed a chairman of the Houston, Tex., civic improvement committee by the Houston Chamber of Commerce.

GEORGE A. HILL, president of Houston Oil Co. of Texas, Houston, Tex., has been appointed chairman of the military affairs committee of the Houston Chamber of Commerce.

J. S. MILLER, land man for Devonian Oil Co. in Jackson, Miss., has been transferred to Tulsa.

CARL E. REISTLE, JR., addressed the student section of A.I.M.E., the University of Texas, recently on "Recent Developments in Drilling and Production Practice."

H. J. TOUPS, of Yazoo City, Miss., is resident agent for the Paluxy Asphalt Co., which is planning to erect a refinery to process Mississippi crude in that state.

THOMAS A. O'DONNELL, California pioneer oil operator and first president of the American Petroleum Institute, is seriously ill at his Palm Springs home suffering complications from influenza and a heart ailment. At last reports he is holding his own.

J. M. KOCH, general sales manager of the Quaker State Oil Refining Corp., with headquarters in Oil City, Pa., is spending several days in California on business and will visit San Francisco, Calif., Portland, Ore., and other areas before returning to his office.

DR. E. R. LEDERER, who retired early last month as president of Bradford Oil Refining Co., has accepted a position in Philadelphia, Pa. He was vice president in charge of manufacturing for Texas Pacific Coal & Oil Co. at Fort Worth, Tex., until he moved to Bradford, and earlier was employed by Atlantic Refining Co.

## Do You Remember?

From The Oil and Gas Journal Files

### 25 YEARS AGO

At Billings, in northern Oklahoma, a wildcat developed four sands between 400 and 900 ft. Showings have also been found near Depew and northwest of Cushing (March).

Prospecting at Damon Mound in coastal Texas is held up during litigation on titles, outside interests claiming about 1,000 acres of the Texas Exploration Co.'s leases. It is fear of such claims that cause operators to "shy" at Texas.

No. 4 Cerro Azul was shut in after flowing an estimated 100,000 bbl. a day. The well was shut in within 13 hours of the time that work was started.

### 20 YEARS AGO

A meeting of New Caucasian Oilfields, Ltd., was held at London to increase the capital stock so as to acquire French interests in the Caucasian oilfields. All that is now necessary is a resumption of normal conditions in the Russian fields.

Business men of Amarillo are raising a fund of $45,000 as a bonus for the discovery of the first oil in the Panhandle. De Queen business men are raising $100,000 for the discoverer of oil in Sevier County, Arkansas.

### 10 YEARS AGO

Leeville is the second geophysical prospect opened for production in Louisiana this year, the other being Iowa.

What is believed to be the largest gas well ever drilled east of the Mississippi River is blowing wild at the rate of 80,000,000 to 100,000,000 cu. ft. a day in Tioga Township, Pennsylvania.

EDWARD J. LEARY, secretary of the New Jersey Petroleum Industries Committee for the past 6 years, is now a major in the U. S. Army.

J. V. STRANGE and K. L. SIMONS, Houston, Tex., have been made vice presidents of United Gas Corp. Mr. Strange becomes general manager and Mr. Simons is manager of the Houston division.

F. E. RICE, Phillips Petroleum Co., Bartlesville, Okla., has been appointed chairman of the A.P.I. central committee on measuring, sampling and testing natural gas and natural gasoline.

J. H. CONTINO, vice president of the National Transit Co., Oil City, Pa., has been named state councilor of the Chamber of Commerce and will represent Oil City in national and state Chamber of Commerce organizations.

ALLEN GIBSON, who joined Cities Service Oil Co. in 1935 and served in Kansas, Oklahoma and New Mexico, has resigned to join the faculty of the University of Oklahoma as assistant professor in the mechanical engineering department.

FRANK MacKAY, vice president of Superior Oil Corp., has resigned, effective March 1, 1941, and will open his own office in Tulsa on April 1. Announcement of a successor for Mr. MacKay will probably be made after the directors' meeting on March 3.

OTTO F. KOCH, of Bradford, Pa., was reelected president and treasurer of Kendall Refining Co. at the regular meeting February 18. Other officers are JOSEPH H. BOVAIRD, vice president; J. B. FISHER, executive vice president and secretary; S. J. BRILL and H. W. JACKSON, assistant secretary and assistant treasurer.

# 35-Year Veteran

Stanley W. Duhig, vice president and treasurer of Shell Union Oil Corp., is a native Californian, and it was in that state that he began his career as an oil man. He spent 11 years in the prolific Coalinga field in the San Joaquin Valley as engineer and accountant. When the Signal Hill field was discovered by Shell in 1921, Mr. Duhig was called upon to organize the company's southern California field offices. He spent 5 years in the Los Angeles office and 2 years in the San Francisco office. For several years before he became associated with the San Francisco office, his activities as head of the sales department accounting work covered California and Arizona.

*STANLEY W. DUHIG*

Mr. Duhig became successively chief accountant in Los Angeles, auditing department manager at San Francisco and then, in 1930, was transferred to the parent company in New York, as secretary-treasurer. In 1938 he was elevated to the position of vice president.

Mr. Duhig was honored last month at a luncheon attended by 355 employes of the company, the occasion being the presentation of a 35-year service award. He enjoys the distinction of being the oldest Shell employe in New York from point of service.

Mr. Duhig has served as chairman of the Controllers Institute Committee for Cooperation with the Securities and Exchange Commission.

CLARENCE BALWANZ, who has been an engineer at the plant of the Gas Service Co., Topeka, Kans., has been appointed superintendent of the Beloit division of the company.

E. A. PASCHAL, Coline Oil Corp. geologist at Amarillo, Tex., addressed the Panhandle Geological Society February 20 on "Major Tectonic Provinces of Southern Oklahoma and Their Relation to Oil and Gas Fields."

FRANK BUTTRAM, president, and H. B. FELL, executive vice president, of I.P.A.A., addressed luncheon meetings of local membership groups in El Dorado, Ark., and Shreveport, La., recently.

KARL A. CROWLEY, Fort Worth, Tex., former solicitor general of the United States, has been appointed special master in chancery to hear and report on claims made against the estate of Mar-Tex Oil Co. and the Bennett Oil Corp.

DR. RAYMOND C. MOORE, of Lawrence, Kans., has been elected president of the American Association of State Geologists, the election taking place at a 2-day meeting in Washington, D. C. ROBERT H. DOTT, of Norman, Okla., is the new secretary.

D. M. SACHS, president of the National Transit Co., has been elected president of the Oil City, Pa., Community Fund Association. M. A. BREWSTER, vice president of the Pennzoil Co., was chosen secretary, and COL. E. V. D. SELDEN, retired oil man, was named treasurer.

JOHN GILBERT WINANT, newly appointed ambassador to Great Britain, is recalled by Mexia-boom (Texas) participants as the financial backer of Arthur Coyle of New Hampshire. Together Messrs. Winant and Coyle developed a small tract and sold their holdings for $1,000,000.

E. F. BERRYMAN, engineer, Stanolind Oil & Gas Co., from Brownfield, Tex., to Boise City, Okla.; ORVILLE S. ALLEN, engineer, Anchor Gasoline Co., from Fry, Tex., to Santa Anna, Tex.; S. R. ALEXANDER, engineer, Texas Co., from Electra, Tex., to Crowell, Tex.; M. D. ST. JOHN, superintendent, Petroleum Producers Co., from Wichita Falls, Tex., to Olney, Tex.; J. R. CRASWELL, superintendent, Canal Oil Co., from New Iberia, La., to Houston, Tex.; J. O. RUNDLE, superintendent, Loffland Brothers, from Opelousas, La., to Jennings, La.; K. M. LAWRENCE, geologist, Amerada Petroleum Corp., from Tuscaloosa, Ala., to Columbus, Miss.; GEORGE H. BELL, superintendent, Smith Petroleum Co., from Grand Rapids, Mich., to Sunbury, Ohio; JOE DAWSON, geologist, Coastal Oil Co., from Jackson, Miss., to Evansville, Ind.; T. C. WILSON, geologist, Atlantic Refining Co., from Pittsburgh, Pa., to Managua, Nicaragua, Central America; MAX LYON, engineer, Carter Oil Co., from Beloit, Kans., to Comanche, Okla.; N. C. MORTIMER, superintendent, Phillips Petroleum Co., from Great Bend, Kans., to Chase, Kans.; KENNETH B. ABSHER, Absher & Booth, from Wichita, Kans., to Mattoon, Ill.; A. H. TONKIN, engineer, Stanolind Pipe Line Co., from Rawlins, Wyo., to Sioux City, Iowa; HENRY McCOY, engineer, Oklahoma Pipe Line Co., from Tulsa, to Port Isabel, Tex.; TOMAS SUERO, geologist, Pure Oil Co., from Tulsa, to Argentine Government Oilfields, La Plata, Argentina, S. A.

BEN CARSEY, division geologist for Humble Oil & Refining Co. and formerly stationed in the West Texas and New Mexico district with headquarters at Midland, Tex., will be transferred to a yet unannounced headquarters in Louisiana to serve as division geologist. He has been division geologist for Humble in the West Texas district for more than 15 years.

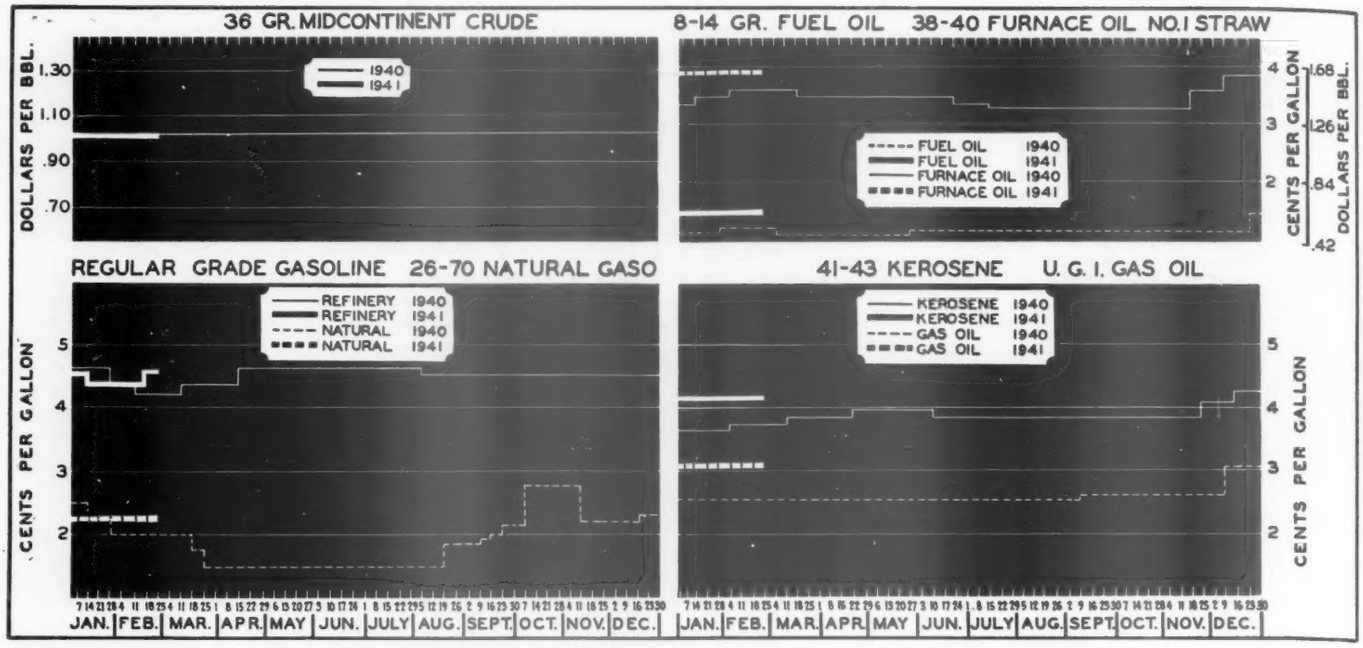
R. H. McLEMORE, with Sun Oil Co., Dallas, Tex., has been elected president of the Petroleum Engineers Club, a newly organized club composed of the petroleum engineers of oil firms in Dallas, Tex. S. S. PARKER, National Tank Co., is vice president; ED PETERS, Frank & Fred Jones Drilling Co., is secretary-treasurer; R. E. LANDIS, National Supply Co., is in charge of entertainment for weekly luncheons the club plans to hold, and W. W. SCOTT, Atlantic Refining Co., is in charge of new memberships.

CHARLES T. LEHRER, formerly associated with the Forest Development Co. in Midland, Tex., has resigned to accept a position as New Mexico district scout for the Tide Water Associated Oil Co. He will continue to reside in Midland.

E. H. BLUM, vice president and a director of the Atlantic Refining Co., with offices in Dallas, Tex., has been honored by having a new 19,405-ton tanker named for him. The tanker will be launched at Chester, Pa., on March 15. Mr. Blum is in charge of Atlantic's oil-production activities.

F. H. McMAHON, in the geological department for the Humble Oil & Refining Co., Houston, Tex., has been transferred to the company's offices at Corpus Christi, Tex., replacing AL DRAPER, who was recently transferred to Wichita Falls, Tex.

AL BUCHANAN, drilling contractor, San Antonio, Tex., is chairman of the South Texas Chamber of Commerce fourth annual Oil Men's Jubilee Banquet, which will be held March 21 at San Antonio. He will also serve as toastmaster. H. R. CULLEN is the honoree at the dinner this year.




Representative Mid-Continent Quotations on Crude Oil and Refined Products, Basis Oklahoma (Group 3)

# Belated Rally of Distillate-Fuel-Oil Demand Strengthens Inland Price

By H. STANLEY NORMAN

DEMAND for distillate fuel oils responded vigorously to the cold wave in northern states and this week the sag on the low side of the market disappeared. Shipments are moving forward in almost unprecedented volume for this fuel-consuming season. Shipping instructions and new business entering the distillate-fuel market this week from northern distributors indicated that jobbers' stocks in that part of the country had been drained down to an irreducible minimum.

Orders for light fuel poured into the Mid-Continent refining district from as far north as the Canadian border. Buyers were not particularly concerned with the price, refiners reported. The chief consideration was ability to make prompt delivery. Resellers met resistance this week in attempting to procure distillate fuels substantially below the quoted-price low of 3⅜ cents for No. 2 burning oil. Kerosene is in active demand at a tank-car price range of 4⅛ to 4⅝ cents.

### Hasty Replacements Necessary

Stocks of light fuel oils had been worked down to a minimum in the northern states because of two important factors. Prospects that a decision will be issued soon on the Petroleum Rail Shippers Association case caused northern buyers to liquidate fuel stocks below normal levels for this season of the year. Still another factor was the possibility that fairly abundant stocks in refinery tanks might exercise an early pressure on the tank-car market and thus provide jobbers with an added margin of profit on consumption in the late-winter weeks.

The severe winter weather blanketing most of the Middle West and East has not so far depressed demand for gasoline. Suppliers of the spot-market demand for motor fuel in the Group 3 (Oklahoma) territory report their producing capacity is sold up through the middle or end of March. Efforts of refiners to augment their motor-fuel production by open-market purchases elsewhere in the territory are meeting firm resistance, if a price concession is involved. Resellers have reported difficulty over the last 3 weeks in attempts to duplicate gasoline prices that were general in part of December and most of January.

The forecast of an 11 per cent increase in the indicated gasoline demand in March over the daily average in February was instrumental in solidifying refiners' price ideas. Inferior grades of motor fuel were available at a few Oklahoma and North Texas refineries in January at 3⅜ cents for resale. Refiners are asking resellers 3½ cents minimum for 60-octane motor fuel.

The nation's gasoline stocks have risen more rapidly than economists consider desirable in the past 60 days but the lag behind the 1940 inventory curve is beginning to widen. The improvement in statistical position of motor fuel is tending to strengthen the market outlook throughout the country.

The necessity of drawing crude supplies from greater distances and from a greater number of connections evolves finally as a higher outlay for raw material. Just as rapidly as this higher cost of crude is transmitted into plant operating expense the market for products logically may be expected to stiffen. There is an active though quiet search under way by refiners for additional crude connections primarily for insurance on supplies when the more pronounced bulge in demand develops this summer.

### Condensate Pressure Eased

Moderation of the pressure of recycling plant condensate on the gasoline tank-car market has been an important factor in recent action of prices. Expansion in the demand for refinery stock has overcome resistance of purchasers to acceptance of recycle condensate in some areas. Condensate producers prefer to sell on a regular established market than to depend on their ability to compete for refinery motor-fuel business. Residual fuel oils are probably the most actively sought products in the Mid-Continent refinery market at prices ranging from 60 to 70 cents per barrel. Economics of plant operation limit Mid-Continent refiners in supplying residuals.

Natural-gasoline market conditions are steady. Demand is in approximate balance with production. The price for 26-lb. material in Oklahoma is unchanged at 2⅜ cents.

### Refined Oil Market Barometer

Market improvement in refinery gasoline is gaining momentum in most territories east of the Rocky Mountains. Refiners are growing more optimistic. The forecast of an 8 per cent increase in motor-fuel demand in March over a year ago augments improvements in basic factors. Distillate fuel oils are generally soft.

**MID-CONTINENT.** The high side of the gasoline market has been advanced.

**GULF COAST:** Motor-fuel prices elevated ¼ cent by most refiners.

**CALIFORNIA:** All grades of fuel oil are in strong market position.

**PENNSYLVANIA:** Demand brisk for gasoline, neutrals and bright stocks.

**CHICAGO:** Zero temperatures last week steadied fuel-oil markets.

# Distillate-Fuel-Price Decrease Follows Drop in Demand

By J. P. O'DONNELL

NEW YORK, Feb. 25.—Further evidence of weakness in the light-fuel-oil market was apparent last week when tank-wagon prices were reduced in a number of East Coast areas and indications of a further reduction in tank-car prices were seen. In contrast heavy fuel oil was reported somewhat stronger but gasoline, apparently showing the effects of rapidly mounting inventories, was easier.

Standard Oil Co. of New Jersey reduced tank-wagon prices of Nos. 2 and 3 fuel oil throughout the State of New Jersey in midweek. Previously reduced northern New Jersey prices were cut 0.3 cent to 6 cents per gallon while southern New Jersey prices were lowered 0.7 cent to make the state-wide price uniform.

Later in the week it was reported that a large northern New Jersey marketer had reduced posted prices to 4.3 cents, the current tank-car quotation at refineries in the New York Harbor area. It was also reported that this price could be shaded ¼ cent so that some No. 2 fuel oil was being disposed of at 4.05 cents. In view of this condition and reports of price concessions at other points throughout the metropolitan area, it was regarded as doubtful that the current quotation of the major companies, 4.3 cents, would be maintained for long.

The decline in heating-oil prices has been under way since the sharp break in coastwise tanker rates was initiated in late December. In addition some market observers are of the opinion that the liquidation of inventories this season will not match that of last year, despite the substantial increase in consumption. The consumption increase has been comparatively uniform over the season but whether or not late season demand will duplicate that of last year when the market became very tight in February and March is extremely doubtful.

The principal change in the market factors from last year is the far more adequate supply of readily available heating oil. Some complaint has been voiced that the comparatively large stocks, regarded as a major factor in the price declines, have been augmented by imports. However, an examination of the latest report on imports, that for December, the month in which the first signs of weakness in heating oil became apparent, shows imports of light oils were of negligible quantities. By far the major quantities of imports have been residual fuel oil. A breakdown in fuel-oil imports by East Coast customs districts for December is shown in an accompanying table.

Figures in table are of quantities for immediate consumption only. In addition 77,325 bbl. of residual fuel oil were withdrawn from bond for consumption and 300,655 bbl. for supplies to vessels. However, the imports shown for December of gas oil were less than 2 per cent of the total made available to the East Coast market. Production in the East Coast refining district totaled 3,908,000 bbl. and an additional 5,979,000 bbl. were received from the Gulf which, plus the 189,602 bbl. imported, made the total available in December slightly over 10,000,000 bbl.

| From— | Gas oil* (bbl.) | Residual fuel oil (bbl.) |
|---|---|---|
| Mexico: | | |
| New York | 118,667 | 214,684 |
| Venezuela: | | |
| New York | 70,935 | 1,144,210 |
| Massachusetts | ..... | 563,334 |
| Rhode Island | ..... | 198,674 |
| Connecticut | ..... | 135,122 |
| Maryland | ..... | 249,761 |
| Florida | ..... | 295,968 |
| Curacao: | | |
| New York | ..... | 60,694 |
| Virginia | ..... | 59,095 |
| Total East Coast | 189,602 | 2,921,542 |

*Includes diesel oil, distillate fuel oil.

Despite the substantial quantity of residual-fuel-oil imports, some of which is reported to be moving at prices lower than those quoted on domestic material, the market for this product remains reasonably firm. Sustained industrial demand is credited with maintaining the current prices.

Diesel fuel was reduced at several South Atlantic ports last week in a move that was regarded more as a reflection of the lower transportation rates than of a decrease in demand. Demand as a matter of fact is reported to be entirely satisfactory in view of seasonal considerations. The reductions, amounting to 10 cents per barrel, were made effective at Baltimore, Wilmington, Norfolk and Charleston. The new quotation, uniform at these ports, is $1.85 per barrel.

The East Coast motor-fuel market was unchanged though accumulating stocks are regarded as threatening. During the last 3 weeks for which reports are available, East Coast stocks have moved up close to 2,000,000 bbl. This increase is held justified by some who anticipate a demand this summer that will tax present refining capacity but the swiftness of the rise is causing concern in other quarters. It is pointed out that if the rate of advance that characterized the 3 weeks ended February 15 is continued through the rest of February and March, an additional 4,500,000 bbl. will be added to East Coast storage.

Lubricating oils, the only product to show noteworthy improvement recently, were unchanged last week after sustained gains. Failure of further gains to materialize was not regarded as a sign of a slowing up in demand, however. One of the large suppliers of Pennsylvania lubricating oils reported domestic demand as very good with neutrals particularly tight.

## Coastal Gasoline Market Continues Improvement

HOUSTON, Tex., Feb. 25.—The Gulf Coast refinery-gasoline market continued to gain strength the past week although increasing weakness was reflected in kerosenes and gas oils. Residual fuels also were softer in price but general feeling in these was that the market was in good shape and should strengthen.

Spot sale of at least three cargoes of 80-research-octane gasoline was reported during the week. Sale price reported was 4⅝ cents, but a check at the opening of the week indicated that there would be no more material of that grade available at that figure. It was doubted by market observers that such material could be bought under 5 cents. A general tightness of low-octane gasolines also was indicated with sellers asking 4 cents and above.

Buyers reported having offers of kerosene at 3¼ cents with some sellers still asking 3½ cents. There is no spot buying in this product and the market is otherwise depressive.

Gas oil (No. 2 fuel) prices sagged another eighth to a quarter cent during the week. Buyers reported being able to get material as low as 2⅞ cents. Increasing supplies of this product are becoming available on the Gulf Coast.

Residual fuels also appeared weaker with at least a couple of cargoes of Bunker C fuel reported offered at 70 cents, which is 5 cents under

*(Continued on Page 135)*

## *A.P.I. Weekly Refinery Statistics*

**Week Ended February 22, 1941**

| | Capacity reporting (per cent) | Total gasoline stocks (bbl.) | Residual fuel-oil stocks (bbl.) | Gas oil and distillate stocks (bbl.) | Daily crude runs (bbl.) |
|---|---|---|---|---|---|
| East Coast | 100.0 | 20,381,000 | 9,326,000 | 12,150,000 | 579,000 |
| Appalachian | 91.0 | 3,210,000 | 485,000 | 426,000 | 124,000 |
| Ind., Ill., and Ky. | 90.2 | 18,383,000 | 3,169,000 | 3,061,000 | 578,000 |
| Okla., Kans., and Mo. | 76.9 | 8,575,000 | 1,951,000 | 1,240,000 | 287,000 |
| Inland Texas | 59.6 | 2,247,000 | 1,488,000 | 375,000 | 122,000 |
| Texas Gulf | 89.2 | 14,310,000 | 6,720,000 | 5,133,000 | 887,000 |
| Louisiana Gulf | 97.6 | 3,348,000 | 2,100,000 | 966,000 | 132,000 |
| N. Louisiana and Ark. | 51.5 | 570,000 | 519,000 | 294,000 | 50,000 |
| Rocky Mountains | 56.0 | 1,547,000 | 446,000 | 166,000 | 46,000 |
| California | 87.3 | 16,391,000 | 70,747,000 | 9,985,000 | 445,000 |
| Total reported | 86.2 | 88,962,000 | 96,951,000 | 33,796,000 | 3,250,000 |
| Est. unreported | ..... | 6,850,000 | 1,680,000 | 585,000 | 340,000 |
| *Est. total | ..... | †95,812,000 | 98,631,000 | 34,381,000 | 3,590,000 |
| *Est. total previous wk. | ..... | 94,741,000 | 99,425,000 | 35,758,000 | 3,630,000 |
| *Feb. 23, 1940 | ..... | 97,512,000 | 103,079,000 | 25,030,000 | 3,490,000 |

*Bureau of Mines. †Includes 6,267,000 bbl. aviation gasoline.

## Stocks of Crude Oil in the United States

(BUREAU OF MINES ESTIMATE)

| | |
|---|---|
| Week ended February 15, 1941 | 260,948,000 barrels |
| Week ended February 8, 1941 | 260,250,000 barrels |
| Week ended February 17, 1940 | 239,838,000 barrels |

Figures do not include stocks of heavy, unrefinable California crude.

# RETAIL OIL MARKETS...

Tank-wagon and filling-station prices on gasoline and kerosene furnished by larger marketing firms

Prices as of February 25, 1941

### Taxes

The gasoline quotations given in the following tables include the 1½-cent federal tax, as well as state, county, and city taxes. The gasoline is the regular or standard grade. In most areas lower grades and a premium grade also are available.

### Standard Oil Co. (Indiana)

| | Gasoline Tank wag. | Dlr. | Incl. tax | Kero. tank wag. |
|---|---|---|---|---|
| Chicago, Ill. | 14.6 | 12.6 | 4.5 | 10.0 |
| Decatur | 14.6 | 13.1 | 4.5 | 9.5 |
| Joliet | 15.6 | 14.1 | 4.5 | 10.0 |
| Peoria | 15.6 | 13.2 | 4.5 | 10.0 |
| Quincy | 15.4 | 13.9 | 4.5 | 9.8 |
| Davenport, Ia. | 15.6 | 14.1 | 4.5 | ‡10.0 |
| Des Moines | 15.4 | 13.9 | 4.5 | ‡9.8 |
| Mason City | 15.8 | 14.3 | 4.5 | ‡10.2 |
| Duluth, Minn. | 16.4 | 14.9 | 4.5 | 10.8 |
| Mankato | 16.0 | 14.5 | 4.5 | 9.5 |
| Minneapolis | 16.0 | 14.2 | 4.5 | 10.4 |
| LaCrosse, Wis. | 17.0 | 15.5 | 5.5 | 10.4 |
| Green Bay | 17.4 | 15.9 | 5.5 | 10.8 |
| Milwaukee | 16.8 | 15.3 | 5.5 | 10.2 |
| Detroit, Mich. | 14.1 | 12.6 | 4.5 | 8.1 |
| Grand Rapids | 14.3 | 12.8 | 4.5 | 9.1 |
| Saginaw | 14.9 | 13.4 | 4.5 | 9.1 |
| Evansville, Ind. | 16.6 | 15.1 | 5.5 | †9.8 |
| Indianapolis | 16.8 | 14.8 | 5.5 | †10.0 |
| South Bend | 16.8 | 15.3 | 5.5 | †10.0 |
| Fargo, N. D. | 18.2 | 16.7 | 5.5 | 11.6 |
| Huron, S. D. | 17.5 | 16.0 | 5.5 | 10.9 |
| Kans. City, Mo.* | 14.9 | 11.9 | 4.5 | 8.6 |
| St. Louis* | 14.7 | 13.2 | 4.5 | 9.6 |
| St. Joseph | 14.9 | 13.0 | 4.5 | 8.4 |
| Wichita, Kans. | 13.8 | 12.3 | 4.5 | 7.2 |

*State tax 2 cents, 1-cent city tax, and 1½-cent federal tax. †Does not include 4-cent state tax. ‡Does not include 3-cent state tax.

Exclusive of state general sales taxes.

Discounts to commercial consumers. On purchases per month off tank-wagon prices: 1,000 gal. or more, 1.5 cents off, minimum delivery 25 gal.

### Stanolex Fuel Oil in Chicago

Effective Dec. 2, 1940, f.o.b. Chicago, tank-wagon prices: Standard heater oil, 1-99 gal., 9.0 cents; 100-149 gal., 8.0 cents; 150 gal. and over, 7.5 cents. Stanolex fuel oil No. 1, 1-99 gal., 8.5 cents; 100-399 gal., 7.5 cents; 400 gal. and over, 7.0 cents. Stanolex furnace oil, 1-99 gal., 8.5 cents; 100-399 gal., 7.5 cents; 400 gal. and over, 7.0 cents. Stanolex fuel oil A, 1-399 gal., 6.0 cents; 400-790 gal. 5.0 cents; 800 gal. and over, 4.75 cents. Stanolex fuel oil B, 1-399 gal., 6.0 cents; 400-799 gal., 5.0 cents; 800 gal. and over, 4.75 cents. Stanolex Bunker C fuel oil, 1-999 gal., 4.75 cents; 1,000 gal. and over, 3.75 cents.

### Ohio

STANDARD OIL CO. OF OHIO

| | Gasoline Cons'r tank wag. | Dlr. vided | Incl. tax | Kero. tank wag. |
|---|---|---|---|---|
| Ohio points | 16.0 | 15.0 | 5.5 | *9.0 |

*Includes state tax of 1 cent.

### Atlantic Coast District

STANDARD OIL CO. OF NEW JERSEY

| | Gasoline Cons'r tank car | Dlr. tank wag. | Incl. tax | Kero. tank wag. |
|---|---|---|---|---|
| Atlantic City | 11.00 | 12.60 | 4.5 | 7.5 |
| Newark | 11.00 | 12.60 | 4.5 | 7.5 |
| Annapolis, Md. | 12.85 | 14.35 | 5.5 | 9.5 |
| Baltimore | 12.25 | 13.75 | 5.5 | 8.4 |
| Cumberland | 13.65 | 15.15 | 5.5 | 10.0 |
| Washington, D.C. | 10.50 | 12.00 | 3.5 | 9.5 |
| Danville, Va. | 14.45 | 16.95 | 6.5 | 9.0 |
| Norfolk | 13.25 | 15.75 | 6.5 | 10.5 |
| Petersburg | 13.55 | 16.05 | 6.5 | 11.2 |
| Richmond | 13.55 | 16.05 | 6.5 | 11.0 |
| Roanoke | 14.75 | 17.25 | 6.5 | 10.0 |
| Charles'n, W. Va. | 14.05 | 16.55 | 6.5 | 11.5 |
| Parkersburg | 13.35 | 15.85 | 6.5 | 11.2 |
| Wheeling | 14.35 | 16.85 | 6.5 | 11.8 |
| Charlotte, N. C. | 16.40 | 16.50 | 7.5 | 9.8 |
| Hickory | 16.95 | 18.45 | 7.5 | 9.7 |
| Mt. Airy | 16.80 | 16.00 | 7.5 | 10.6 |
| Raleigh | 16.15 | 17.00 | 7.5 | 9.9 |
| Salisbury | 16.45 | 15.50 | 7.5 | 10.3 |
| Charleston, S. C. | 14.25 | 16.75 | 7.5 | 9.25 |
| Columbia | 15.10 | 17.60 | 7.5 | (*) |
| Spartanburg | 15.80 | 18.30 | 7.5 | 12.2 |

**Price basis to Essolene undivided dealers: Dealer tank-wagon price less 0.5 cent per gallon. Price basis to commercial consumers, effective March 8, 1937,** in Maryland, District of Columbia, and in Arlington and Fairfax counties in Virginia and March 12 in New Jersey: To contract accounts purchasing at least one full compartment at a time by hose connection, on yearly purchases: From 2,500 to 100,000 gal., consumer tank-wagon price at time and place of delivery: 100,000 gal. per year, consumer tank-car price plus 0.5 cent per gallon. Consumer tank-wagon price generally will be equivalent to dealer tank-wagon price less 0.5 cent per gallon.

Effective January 16, 1939, in North Carolina the commercial consumer schedule became as follows: Single deliveries of 50 gal. or more, consumer tank-wagon price. Single deliveries of less than 50 gal., 4 cents per gallon over consumer tank-wagon price. Generally the posted consumer tank-wagon price will be equivalent to the dealer price, less 0.5 cent per gallon. The above policy also applies in South Carolina, effective January 23, 1939.

*Kerosene business of the company at these points now exclusively handled by dealers.

### Southern District

STANDARD OIL CO. (KENTUCKY)

| | Gasoline Cons'r tank wag. | Net dlr. | Incl. tax | Kero. tank wag. |
|---|---|---|---|---|
| Atlanta, Ga. | 15.0 | 15.0 | 7.5 | 9.0 |
| Augusta | 16.5 | 16.5 | 7.5 | 9.5 |
| Macon | 16.5 | 16.5 | 7.5 | 9.0 |
| Savannah | 15.5 | 15.5 | 7.5 | 9.0 |
| Birmingham, Ala. | 16.5 | 16.5 | 8.5 | 8.0 |
| Mobile | 15.5 | 15.5 | 9.5 | 8.0 |
| Montgomery | 18.0 | 18.0 | 9.5 | 10.0 |
| Jackson, Miss. | 15.0 | 15.0 | 7.5 | 9.0 |
| Vicksburg | 15.5 | 15.5 | 7.5 | 8.5 |
| Jacksonville, Fla. | 16.0 | 16.0 | 8.5 | 8.0 |
| Miami | 16.0 | 16.0 | 8.5 | 8.0 |
| Pensacola | 17.0 | 17.0 | 9.5 | 8.0 |
| Tampa | 16.0 | 16.0 | 8.5 | 8.0 |
| Lexington, Ky. | 15.5 | 15.5 | 6.5 | 9.0 |
| Covington | 13.5 | 13.5 | 6.5 | 9.0 |
| Louisville | 15.0 | 15.0 | 6.5 | 8.5 |
| Paducah | 12.5 | 12.5 | 6.5 | 8.5 |

Price basis to tank-wagon consumers, effective January 4, 1937, 3 cents per gallon below tank-wagon price.

Montgomery, Ala., has a county tax of 1 cent per gallon, and a city tax of 1 cent per gallon on gasoline, in addition to state tax, and 1 cent per gallon on kerosene. Mobile, Ala., has a city gasoline tax of 2 cents per gallon: Birmingham, Ala., has a city gasoline tax of 1 cent per gallon; Pensacola, Fla., has a city gasoline tax of 1 cent. All are included in the table.

### Pennsylvania and Delaware

ATLANTIC REFINING CO.

| | Gasoline Cons'r tank car | Dlr. tank wag. | Incl. tax | Kero. tank wag. |
|---|---|---|---|---|
| Philadelphia, Pa. | 12.5 | 13.5 | 5.5 | 10.0 |
| Pittsburgh | 13.0 | 15.0 | 5.5 | 10.5 |
| Allentown | 13.0 | 14.5 | 5.5 | 10.5 |
| Erie | 12.5 | 15.0 | 5.5 | 10.0 |
| Scranton | 13.0 | 14.5 | 5.5 | 10.5 |
| Altoona | 13.0 | 15.0 | 5.5 | 10.5 |
| Dover, Del. | ... | 14.0 | 5.5 | 10.5 |
| Wilmington | ... | 13.5 | 5.5 | 10.0 |

Price basis to undivided dealers. dealer tank-wagon price less 0.5 cent per gallon.

Discount on kerosene, 2 cents per gallon off tank-wagon price on tank-wagon deliveries of 25 gal. or more at one time.

### Pacific Coast Territory

STANDARD OIL CO. OF CALIFORNIA

| | Gasoline Tank truck | Serv. sta. | Incl. tax | Kero. tank wag. |
|---|---|---|---|---|
| San Francisco | 16.5 | 17.5 | 4.5 | 11.5 |
| Los Angeles | 16.0 | 17.0 | 4.5 | 10.0 |
| Fresno, Calif. | 17.5 | 18.5 | 4.5 | 12.5 |
| Phoenix, Ariz. | 20.5 | 21.5 | 6.5 | *17.5 |
| Reno, Nev. | 19.5 | 20.5 | 5.5 | 13.5 |
| Portland, Ore. | 19.0 | 20.0 | 6.5 | 13.5 |
| Seattle, Wash. | 19.0 | 20.0 | 6.5 | 13.5 |
| Spokane | 20.5 | 21.5 | 6.5 | 16.5 |
| Tacoma | 19.0 | 20.0 | 6.5 | 13.5 |

*Includes 5-cent state tax.

Discount to dealers: On gasoline, off tank-wagon price, to 100 per cent dealers, 3 cents. To commercial consumers: On tank-wagon price; on single deliveries of 40 gal. and over, advance quantity discount extended at time of delivery, 3 cents. Service-station schedule applies on single deliveries less than 40 gal. On kerosene in tank-car, transport-truck, and trailer delivery, 3 cents off tank-wagon price; plant deliveries to jobbers, 2.5 cents below tank wagon.

March 18, 1939, split dealer discount was canceled.

### New York and New England

SOCONY-VACUUM OIL CO., INC.

| | Gasoline Cons'r tank car | Dlr.* tank wag. | Incl. tax | Kero. tank wag. |
|---|---|---|---|---|
| Albany | 12.7 | 12.9 | 5.5 | 7.8 |
| Met. New York | 12.5 | 12.7 | 5.5 | 7.6 |
| Buffalo | 13.0 | 13.5 | 5.5 | 8.1 |
| Rochester | 13.2 | 13.7 | 5.5 | 8.9 |
| Syracuse | 12.5 | 10.7 | 5.5 | 8.8 |
| Portland, Me. | 12.2 | 12.7 | 5.5 | 8.0 |
| Manchester, N. H. | 13.4 | 12.8 | 5.5 | 8.9 |
| Burlington, Vt. | 11.8 | 12.0 | 5.5 | 8.3 |
| Boston, Mass. | 10.9 | 11.4 | 4.5 | 8.0 |
| Worcester | 11.5 | 11.5 | 4.5 | 8.0 |
| Hartford, Conn. | 11.3 | 11.5 | 4.5 | 7.5 |
| New Haven | 11.1 | 11.3 | 4.5 | 7.4 |
| Providence, R. I. | 10.9 | 11.9 | 4.5 | 8.0 |

*Undivided.

Effective August 8, 1940, the company changed its commercial consumer policy in New York and New England to the following:

Full compartment deliveries: Accounts buying less than 20,000 gal. annually, 0.5 cent above the commercial-consumer price; accounts buying from 20,000 to 120,000 gal. annually, commercial-consumer price; accounts buying 120,000 gal. annually and above, 0.25 cent off consumer price. Split compartment deliveries: Delivery of less than a full compartment, 250 gal., commercial-consumer price plus 1 cent. Steel-barrel deliveries: Commercial price plus 3 cents.

### Rocky Mountain District

CONTINENTAL OIL CO.

| | Gasoline Tank wag. | Incl. tax | Kero. tank wag. |
|---|---|---|---|
| Denver, Colo. | 14.5 | 5.5 | 10.5 |
| Grand Junction | 16.5 | 5.5 | 12.0 |
| Pueblo | 15.5 | 5.5 | 9.0 |
| Casper, Wyo. | 16.5 | 5.5 | 11.5 |
| Cheyenne | 12.0 | 5.5 | 11.0 |
| Billings, Mont. | 16.5 | 6.5 | 12.0 |
| Butte | 15.5 | 6.5 | 13.0 |
| Great Falls | 15.5 | 6.5 | 12.0 |
| Helena | 15.5 | 6.5 | 12.5 |
| Salt Lake, Utah | 16.0 | 5.5 | 14.0 |
| Boise, Idaho | †18.6 | 6.5 | 16.0 |
| Twin Falls | †19.6 | 6.5 | 16.5 |
| Albuquerque, N. M. | *16.0 | 7.0 | 9.5 |
| Roswell | *14.0 | 7.0 | 8.0 |
| Santa Fe | ‡17.0 | 7.5 | 9.5 |

*Includes city tax of 0.5 cent. †Includes toll-bridge tax of 1 mill. ‡Includes city tax of 1 cent.

Tank wagon represents price to consumers. Dealer represents price to dealers. If no dealer price is quoted, the tank-wagon price applies to all classes of trade.

### Central South District

STANDARD OIL CO. OF LOUISIANA

| | Gasoline Cons'r tank car | Dlr. tank wag. | Incl. tax | Kero. tank wag. |
|---|---|---|---|---|
| New Orleans, La. | 14.25 | 16.75 | 8.5 | ‡10.0 |
| Baton Rouge | 14.75 | 17.25 | 8.5 | ‡10.5 |
| Alexandria | 14.75 | 17.25 | 8.5 | ‡10.5 |
| Lafayette | 15.00 | 17.50 | 8.5 | ‡10.0 |
| Lake Charles | 14.75 | 17.25 | 8.5 | ‡10.0 |
| Shreveport | 14.00 | 16.50 | 8.5 | 10.0 |
| Knoxville, Tenn. | 18.00 | 20.00 | 8.5 | 12.5 |
| Memphis | 16.00 | 18.00 | 8.5 | 11.0 |
| Chattanooga | 17.50 | 17.35 | 8.5 | 12.0 |
| Nashville | 17.00 | 17.50 | 8.5 | 11.0 |
| Bristol | 18.25 | 18.75 | 8.5 | 12.0 |

Essolene at dealer price less 0.5 cent per gallon to undivided dealers.

‡Includes 1-cent state tax.

Price basis to commercial consumers: Effective May 15, 1937, deliveries of 50 gal. or more in one territory take posted consumer tank-wagon price. Accounts taking deliveries of less than 50 gal. at one time pay posted consumer tank-wagon price plus 4 cents per gallon. Generally, the posted consumer tank-wagon price will be equivalent to the dealer price less 0.5 cent per gallon. Kerosene prices include 1-cent state tax.

Effective February 24, 1939, the company reestablished in New Orleans the commercial consumer policy on motor fuel effective in the rest of the state.

Effective December 12, 1938, the company revised its commercial consumer policy on motor fuel in New Orleans, as follows: Single deliveries of less than 50 gal., consumer tank car plus 2 cents per gallon 50 to 199 gal., consumer tank car plus 1 cent per gallon; 200 gal. and over, consumer tank car plus 0.5 cent per gallon.

### Oklahoma and Arkansas

CONTINENTAL OIL CO.

| | Gasoline Tank wag. | Incl. tax | Kero. tank wag. |
|---|---|---|---|
| Texarkana, Ark. | 13.5 | 5.5 | 6.0 |
| Fort Smith | 13.5 | 5.5 | 6.5 |
| Little Rock | 16.0 | 8.0 | 8.0 |
| Muskogee, Okla. | 13.5 | 5.5 | 7.0 |
| Oklahoma City | 11.5 | 5.5 | 6.5 |
| Tulsa | 12.5 | 5.5 | 6.0 |

Tank wagon represents price to consumers. If no dealer price is quoted, the tank-wagon price applies to all classes of trade.

### Nebraska

STANDARD OIL CO. OF NEBRASKA

| | Gasoline Tank wag. | Dlr. | Incl. tax | Kero. tank wag. |
|---|---|---|---|---|
| Omaha | 17.4 | 15.9 | 6.5 | 9.8 |
| McCook | 17.0 | 14.4 | 6.5 | 9.5 |
| Norfolk | 17.5 | 15.9 | 6.5 | 9.9 |
| North Platte | 17.8 | 16.0 | 6.5 | 10.2 |
| Scottsbluff | 17.4 | 15.0 | 6.5 | 10.8 |

Discounts to commercial consumers for tank-wagon deliveries covered only by standard commercial consumers contract, effective January 1, 1935.

### Texas

| | Gasoline Tank wag. | Dlr. | Incl. tax | Kero. tank wag. |
|---|---|---|---|---|
| Dallas, Tex. | 11.5 | 15.5 | 5.5 | 6.0 |
| Fort Worth | 11.5 | 15.5 | 5.5 | 7.0 |
| Houston | 12.0 | 16.0 | 5.5 | 8.0 |
| San Antonio | 12.5 | 17.0 | 5.5 | 8.0 |

### Naphtha

STANDARD OIL CO. (INDIANA)

| | Tank wagon* |
|---|---|
| Oleum spirits | 16.2 |
| V.M.&P. naphtha | 16.5 |
| Cleaners' naphtha | 15.5 |
| Stanisol | 15.5 |

*Prices include 3-cent Illinois tax but not 1-cent federal tax nor 2 per cent retail occupational tax.

Prices f.o.b. Chicago. Each price subject to discount of 1 cent per gallon for 150-gal. lots if covered by contract.

### Canada

3-Star Imperial Gasoline
IMPERIAL OIL, LTD.

| | Gasoline Tank wag. | Incl. tax | Kero. tank wag. |
|---|---|---|---|
| Halifax, N. S. | 24.5 | 10.0 | 18.0 |
| St. John, N. B. | 24.5 | 10.0 | 18.0 |
| Montreal, Que. | 24.0 | 8.0 | 16.5 |
| Toronto, Ont. | 24.5 | 8.0 | 17.0 |
| Hamilton, Ont. | 24.5 | 8.0 | 17.0 |
| Winnipeg, Man. | 27.5 | 7.0 | 22.5 |
| Brandon, Man. | 28.0 | 7.0 | 22.5 |
| Regina, Sask. | 25.0 | 7.0 | 20.0 |
| Saskatoon, Sask. | 28.0 | 7.0 | 23.0 |
| Edmonton, Alta. | 25.9 | 7.0 | 20.0 |
| Calgary, Alta. | 23.0 | 7.0 | 18.0 |
| Vancouver, B. C. | 21.0 | 7.0 | 23.0 |

## Tank-Wagon Changes

Standard Oil Co. of New Jersey advanced the dealer tank-wagon price of regular gasoline 1 cent per gallon February 13 at Charlotte, N. C. The company reduced kerosene tank-wagon price 1 cent February 13 at Roanoke, Va.

Continental Oil Co. reduced the tank-wagon price of third-structure gasoline 0.6 cent per gallon February 10 at North Little Rock, Ark.

Standard of New Jersey reduced the dealer tank-wagon price of kerosene 0.2 cent per gallon at Baltimore, Md. February 18. At the same time the company generally reduced kerosene 0.2 cent per gallon in North Carolina, excepting at Charlotte and Hickory.

Standard of New Jersey reduced tank-wagon price of No. 2 and No. 3 fuel oil in amounts ranging from 0.2 to 0.5 cent per gallon throughout Maryland and the District of Columbia on February 17. A reduction of 0.2 cent per gallon was made February 18 throughout Virginia. On February 19, Standard of New Jersey reduced the tank-wagon price of No. 2 and No. 3 fuel oil 0.3 cent per gallon in northern New Jersey. A reduction of 0.7 cent per gallon was made in southern New Jersey.

# PRICES OF REFINED PRODUCTS...

All quotations f.o.b. plant in cars for interstate or export movement except as otherwise noted

Prices as of February 25, 1941
(Most prices in cents per gallon)

The quotations are exclusive of the federal excise taxes of 1 cent a gallon on gasoline and 4 cents a gallon on lubricating oils. Octane ratings in Middle West, Mid-Continent, and Southwest are based on A.S.T.M. method of testing.

## Refinery Gasoline

**OKLAHOMA (Group 3)—**

| | | |
|---|---|---|
| U. S. Motor grades: | | |
| 72-74 octane (regular) | .04⅝ | .04⅝ |
| 63-66 octane | .04 | .04¼ |
| 60 octane and below | .03⅝ | .03¾ |
| 60-62 400 grades: | | |
| 72-74 octane (regular) | .04⅝ | .04⅝ |
| 63-66 octane | .04 | .04¼ |
| 60 octane and below | .03⅝ | .03¾ |

**NORTH TEXAS—**

| | | |
|---|---|---|
| U. S. Motor grades: | | |
| 72-74 octane (regular) | .04⅝ | .04½ |
| 63-66 octane | .03⅞ | .04⅛ |
| 60 octane and below | .03⅝ | .03⅞ |
| 60-62 400 | .03⅝ | .04½ |

**NORTH LOUISIANA (Ark. and N. La. delivery)—**

| | | |
|---|---|---|
| U. S. Motor grades: | | |
| 72-74 octane (regular) | .04⅝ | .04½ |
| 63-66 octane | .03⅞ | .04⅛ |
| 60 octane and below | .03¾ | .03⅞ |

**ARKANSAS (Ark. and N. La. del.)—**

| | | |
|---|---|---|
| U. S. Motor grades: | | |
| 72-74 octane (regular) | .04⅝ | .04½ |
| 60 octane and below | .03⅝ | .03¾ |

**CHICAGO (Based on Group 3)—**

| | | |
|---|---|---|
| U. S. Motor grades: | | |
| 72-74 octane (regular) | .04⅝ | .04⅝ |
| 63-66 octane | .04 | .04⅛ |
| 60 octane and below | .03⅝ | .03¾ |
| 60-62 400 grades: | | |
| 72-74 octane (regular) | .04⅝ | .04⅝ |
| 63-66 octane | .04 | .04¼ |
| 60 octane and below | .03⅝ | .03¾ |

**PENNSYLVANIA (inland refineries)—**

| | |
|---|---|
| 74-76 octane (regular) | .06 |
| 72-74 octane | .05¾ |

**CALIFORNIA (domestic movement)—**

| | | |
|---|---|---|
| 58-60 400, 65 oct. and higher | .05½ | .07¼ |
| 54-58 U. S. Motor | .04½ | .06¼ |

**EAST COAST (domestic)—**

| | | |
|---|---|---|
| U. S. Motor grades: | | |
| New York (Bayonne)* | .05½ | .05¾ |
| Philadelphia | .05½ | .06¾ |
| Boston | .05½ | .06 |
| Baltimore | .05½ | .06¾ |
| Charleston, S. C. | .06¼ | .06½ |

*All grades of gasoline ⅛ to ¼ cent less for barge shipments. New York Harbor prices are for New York and New England delivery. Prices for New Jersey delivery ¼ cent lower.

**GULF COAST (domestic)—**

| | | |
|---|---|---|
| U. S. Motor grades: | | |
| 72-74 octane (leaded) | .04 | .04¼ |
| 70-72 octane (unleaded) | .04¼ | .04⅝ |
| 68-70 octane (unleaded) | .03¾ | .04 |
| Below 68 octane (unleaded) | .03½ | .03⅝ |

## Natural Gasoline

**OKLAHOMA (Group 3)—**

| | | |
|---|---|---|
| Grade 26-70 | | .02⅜ |
| Grade 18-55 | .02¾ | .02⅞ |

**NORTH TEXAS—**

| | | |
|---|---|---|
| Grade 26-70 | | .02 |
| Grade 18-55 | | .02⅜ |

**CALIFORNIA—**

| | | |
|---|---|---|
| 75-85 375-390 | .04½ | .05¼ |

**NORTH LOUISIANA (Ark. and N. La. delivery)—**

| | | |
|---|---|---|
| Grade 26-70 | | .02 |

## Tractor Fuel

**OKLAHOMA (Group 3)—**

| | | |
|---|---|---|
| 40-42 gr., 315-325 i.b.p., 110-flash, 540-550 e.p. | .03½ | .03⅝ |
| 41-43 gr., 300-320 i.b.p., 110-125 flash, 500-520 e.p. | .03⅝ | .03¾ |
| 46-48 gr., 210-230 i.b.p., 480-max., e.p. | .03⅞ | .04 |

## Kerosene

(All kerosene water white)

**OKLAHOMA (Group 3)—**

| | | |
|---|---|---|
| 42-44 | .04¼ | .04⅜ |
| 41-43 | .04⅛ | .04¼ |

**NORTH TEXAS—**

| | | |
|---|---|---|
| 41-43 | .04 | .04⅛ |

**NORTH LOUISIANA (Ark. and N. La. delivery)—**

| | | |
|---|---|---|
| 41-43 | .04 | .04⅛ |

**ARKANSAS (Ark. and N. La. del.)—**

| | | |
|---|---|---|
| 41-43 | .04 | .04¼ |

**PENNSYLVANIA (inland refineries)—**

| | | |
|---|---|---|
| 46 | .05¼ | .05½ |
| 45 | .05⅜ | .05¼ |

**CHICAGO (Based on Group 3)—**

| | | |
|---|---|---|
| 42-44 | .04¼ | .04⅜ |
| 41-43 | .04⅛ | .04¼ |

**CALIFORNIA (Pac. Coast market)—**

| | | |
|---|---|---|
| 38-40 high-burning test | .04½ | .05½ |

**NEW YORK (Bayonne, N. J.)—**

| | |
|---|---|
| 41-43 | .049 |

**GULF COAST (domestic)*—**

| | | |
|---|---|---|
| 41-43 | .03¼ | .03½ |

*Barge price ⅛ cent lower.

## Furnace Oil

**OKLAHOMA (Group 3)—**

| | | |
|---|---|---|
| Range oil | .03⅞ | .04⅛ |
| No. 1 prime white, 38-42 | .03¾ | .04 |
| No. 1 straw, 38-40 | .03¾ | .04 |
| No. 2 straw, 32-36 | .03⅝ | .03⅝ |
| No. 3 zero to 10, 28-32 | .03¼ | .03½ |

**NORTH TEXAS—**

| | | |
|---|---|---|
| No. 1 prime white, 38-42 | .03¾ | .03⅞ |
| No. 1 straw, 38-40 | .03⅝ | .03¾ |

**NORTH LOUISIANA (Ark. and N. La. delivery)—**

| | | |
|---|---|---|
| No. 2, 32-36 | .03½ | .03⅝ |

**ARKANSAS (Ark. and N. La. del.)—**

| | | |
|---|---|---|
| No. 2, 32-36 | .03½ | .03⅝ |

**CHICAGO (Based on Group 3)—**

| | | |
|---|---|---|
| Range oil | .03⅞ | .04⅛ |
| No. 1 prime white, 38-42 | .03¾ | .04 |
| No. 2 straw, 32-36 | .03⅝ | .03⅝ |
| No. 3 zero to 10, 28-32 | .03¼ | .03½ |

**NEW YORK (Bayonne, N. J.)—**

| | |
|---|---|
| *No. 1 | .049 |
| *No. 2 | .043 |
| *No. 4 | .043 |

*Barge deliveries ⅛ to ¼ cent under above tank-car price.

## Gas Oil and Fuel Oil

(Gas oil per gal., fuel oil per bbl.)

**OKLAHOMA (Group 3)—**

| | | |
|---|---|---|
| U.G.I. gas oil, under 35 | .03⅛ | .03¼ |
| No. 5, low pour point, 18-22 | .75 | .80 |
| No. 6, 15 and above, 8-14 | .60 | .65 |

**NORTH TEXAS—**

| | | |
|---|---|---|
| U.G.I. gas oil, under 35 | .03 | .03⅛ |
| No. 5, low pour point, 18-22 | .75 | .80 |
| No. 6, 15 and above, 8-14 | .60 | .65 |

**NORTH LOUISIANA (Ark. and N. La. delivery)—**

| | |
|---|---|
| 10-14 fuel oil, industrial | .70 |

**CHICAGO (Based on Group 3)—**

| | | |
|---|---|---|
| U.G.I. gas oil | .03⅛ | .03¼ |
| No. 5, low pour point, 18-22 | .75 | .80 |
| No. 5, 15 and above, 18-22 | .60 | .70 |
| No. 6, low pour point, 10-16 | .60 | .70 |
| No. 6, 15 and above, 8-14 | .60 | .65 |

**PENNSYLVANIA (inland refineries)—**

| | | |
|---|---|---|
| 36-40 | .04⅛ | .05 |

**CALIFORNIA—**

Los Angeles:

| | | |
|---|---|---|
| 30-40 gas oil, per bbl. | 1.10 | 1.25 |
| 24 plus diesel, per bbl. | 1.10 | 1.25 |
| 24 plus diesel (bunkers) | 1.20 | 1.35 |
| 12-16 (bunkers at tidewater) | .65 | .75 |
| 10-16 (cargo lots) | .65 | .75 |
| 12-17 (tank cars) | .60 | .75 |
| 10-17 (high sulfur) | .50 | .65 |

San Joaquin Valley:

| | | |
|---|---|---|
| 10-18 (tank cars) | .55 | .70 |
| 24 plus diesel, per bbl. | 1.10 | 1.25 |

San Francisco:

| | | |
|---|---|---|
| 24 plus diesel, per bbl. | 1.35 | 1.40 |
| 24 plus diesel (bunkers) | 1.40 | 1.50 |
| 10-16 (bunkers) | .75 | .80 |

**GULF COAST—**

| | | |
|---|---|---|
| No. 2 fuel | .03 | .03¼ |
| 43-47 diesel | .03⅛ | .03¼ |
| 48-52 diesel | .03⅛ | .03⅜ |
| 53-57 diesel | .03½ | .03⅞ |
| 58-and-above diesel | .03⅝ | .03¾ |
| Diesel bunkers | | 1.40 |
| Bunker C (bulk cargoes) | | .75 |
| Bunker C (bunkers) | | .80 |

**NEW YORK (Bayonne, N. J.)—**

| | | |
|---|---|---|
| 27 plus, gas oil | | .04⅞ |
| 28-30 diesel (lighterage 6¼c per bbl.) | | 1.75 |
| 28-30 diesel (tank cars) | | .043 |
| Bunker C (to ocean-going ships in N. Y. Harbor) | | 1.25 |
| Industrial fuel (tank cars) | .034 | .036 |

Lighterage charge 5c bbl. additional.

## Bright and Steam Refined

**OKLAHOMA (Group 3)—**

| | |
|---|---|
| 200-210 D, 10-25 | .18 |
| 150-160 D, 0-10 | .13½ |
| 150-160 D, 10-25 | .13 |
| 100-110 D, 0-10 | .13 |
| 100-110 D, 10-25 | .12½ |
| Steam refined: | |
| 600 dark green (untreated) | .07 |

**PENNSYLVANIA—**

Bright Stocks (Pennsylvania Grade No. 8 color, 140-150 at 210, 545-550 flash):

| | |
|---|---|
| 10 pour point | .16½ |
| 15 pour point | .15½ |
| 25 pour point | .14 |
| Steam refined: | |
| 600 | .09 .11 |
| 650 | .09 .11 |
| 600 flash | .09½ .12 |
| 630 flash | .11 .12 |

## Neutral Oil

(Vis. at 100° F. except Pennsylvania and color N.G.A.)

**OKLAHOMA (Group 3)—**

| | | |
|---|---|---|
| 0-10 pour point: | | |
| 150-3 | | .08 |
| 180-3 | | .08½ |
| 200-3 | | .08½ |
| 250-3 | | .10 |
| 280-3 | | .10½ |
| 280-4 | | .10 |
| 300-3½ | | .11 |
| 350-3½ | | .11½ |
| 400-3½ | | .12 |
| 500-3½ | | .12½ |
| 600-3½ | | .13 |
| 100-2½ paraffin oil 10-25 | | .05¼ |
| 10-25 pour point: | | |
| 200-3 | | .08 |
| 250-3 | | .09½ |
| 280-3 | | .10 |
| 280-4 | | .09½ |

**GULF COAST—**

| | | |
|---|---|---|
| Pale oils: | | |
| 100-3 | .05½ | .05¼ |
| 200-3 | .07⅛ | .07¼ |
| 300-3 | .07½ | .07⅝ |
| 500-3½ | .08¼ | .08½ |
| 750-3½ | .08⅝ | .08¾ |
| 1,200-3½ | .08¾ | .08⅞ |
| 2,000-4 | | .09 |
| 3,000-4 | | .10½ |
| Red oils: | | |
| 200-5-6 | .06⅞ | .07 |
| 300-5-6 | .07¼ | .07½ |
| 500-5-6 | .08 | .08¼ |
| 750 | .08⅜ | .08½ |
| 1,200-5-6 | .08½ | .08⅝ |

**CALIFORNIA (moving to dom. market)—**

| | | |
|---|---|---|
| Pale oils: | | |
| 100-2½-3 | .07¼ | .08 |
| 200-2½-3 | .07¼ | .08 |
| 300-2½-3 | .07¼ | .08 |
| 400-3-4 | .07¼ | .08 |
| 450-3-4 | .07¼ | .08 |
| 550-3-4 | .09 | .11 |
| 600-3-4 | .09 | .11 |
| Red oils: | | |
| 200-4-5 | .07¼ | .08 |
| 300-5-6 | .07¼ | .08 |
| 350-5-6 | .09¼ | .11½ |
| 400-5-6 | .09¼ | .11½ |
| 450-5-6 | .09¼ | .11½ |
| 500-5-6 | .09¼ | .11½ |
| 600-5-6½ | .09¼ | .11½ |
| 700-6½ plus | .09¼ | .11½ |
| 750-6½ plus | .09¼ | .11½ |
| 900-6½ plus | .09¼ | .11½ |

**PENNSYLVANIA—**

| | | |
|---|---|---|
| 150 vis. at 70° F., 3 color, 400-405 flash: | | |
| Zero pour point | | .22½ |
| 10 pour point | | .21½ |
| 15 pour point | | .20½ |
| 25 pour point | | .19 |
| 200 vis. at 70° F., 3 color: | | |
| Zero pour point | | .24½ |
| 10 pour point | | .23½ |
| 15 pour point | | .22½ |
| 25 pour point | | .21 |

## Wax and Petrolatum

(Prices per pound)

**OKLAHOMA (Group 3)—**

| | | |
|---|---|---|
| 124-126 (A.m.p.) w.c. scale | .02½ | .02¾ |

**PENNSYLVANIA (inland refineries)—**

| | | |
|---|---|---|
| 122-124 (A.m.p.) w.c. scale | .02¼ | .02½ |
| 124-126 (A.m.p.) w.c. scale | .02¼ | .02½ |

**NEW YORK—**

| | |
|---|---|
| Wax in bags fully refined: | |
| 125-127 (A.m.p.) wax | .0560 |
| 128-130 (A.m.p. wax | .0560 |
| 130-132 (A.m.p.) wax | .0585 |
| 133-135 (A.m.p.) wax | .0615 |
| 135-137 (A.m.p.) wax | .0640 |
| Crude scale: | |
| 124-126 (A.m.p.) w.s. | .02¼ .02½ |
| 124-126 (A.m.p.) y.s. | .02¼ .02½ |
| Petrolatum in barrels, carload lots: | |
| Dark green | .02125 .02625 |
| Amber | .02375 .02875 |
| Extra amber | .02625 .03000 |
| Lily white | .04375 .05125 |
| Snow white | .05125 .06000 |
| Cream | .03375 .04125 |

## Export Prices

### GASOLINE

**GULF COAST—**

| | | |
|---|---|---|
| 60-62 400 | .03¼ | .04 |
| 61-63 390 | .03¼ | .04 |
| 64-66 375 | .03¼ | .04 |

**LOS ANGELES—**

| | | |
|---|---|---|
| U. S. Motor grades: | | |
| Above 69 octane | .05½ | .05¾ |
| 65-69 octane | .05¼ | .05½ |
| 60-65 octane | .04½ | .05 |

### KEROSENE

**GULF COAST—**

| | | |
|---|---|---|
| 41-43 water white | .03½ | .03¾ |

**LOS ANGELES—**

| | | |
|---|---|---|
| 41-43 water white | .05 | .05¼ |

### LUBRICANTS

(Pennsylvania Grade)

**NEW YORK (f.a.s. in bbl.)—**

| | | |
|---|---|---|
| Cylinder stocks: | | |
| 600 S.R. unfiltered | .16 | .17 |
| 630 S.R. unfiltered | .17 | .17½ |
| 600 flash, S.R. | | .18 |
| 650 flash, S.R. | | .20 |
| Bright stock.: | | |
| Light, 25 pour point | | .22 |

### NEUTRAL OIL

| | | |
|---|---|---|
| 200-3 color | .27 | .27½ |
| 150-3 color | .25½ | .26 |

### PARAFFIN WAX

**NEW YORK (prices per lb.)—**

| | |
|---|---|
| 123-125 A.m.p. | .0560 |
| 125-127 A.m.p. | .0560 |
| 128-130 A.m.p. | .0585 |
| 133-135 A.m.p. | .0615 |
| 135-137 A.m.p. | .0640 |
| Crude scale: | |
| 124-126 w.s. | .02¼ .02⅜ |
| 124-126 y.s. | .02¼ .02⅜ |

# EQUIPMENT PROGRESS...

## New Design in Printing Machines Announced by Bruning Co.

New simplicity of design and new operating usefulness are embodied in a new printer just announced by Charles Bruning Co., Inc., 100 Reade Street, New York. Known as the Model "55" BW printer, this machine is said to be the most compact printer of its capacity on the market, since it measures only 32 in. wide, 62 in. long, and 48 in. high.

The Model "55," a 42-in. printer, operates with either cut sheets or roll stock. It prints ink tracings at from 12 to 15 ft. per minute. A full-view speed indicator placed at the center of the front, above the feed board, makes the speed of the machine readily visible to the operator at all times.

An exclusive feature of the Model "55" printer is its new print and tracing return. The entire top of the machine serves as a return tray, and the return is so designed that the tracing enters the tray on top of the print—in exactly the same way as it is inserted in the machine. No reversing of the tracing is necessary when reinserting it into the machine. Furthermore, as they emerge from the printer onto the trays, exposed sheets stack themselves almost automatically.

The light source of the new Model "55" printer is a 55-watt new-type mercury-vapor quartz lamp. This quartz lamp furnishes uniform exposure, without flickering, and is guaranteed for a life of 1,000 hours. The lamp is installed in a revolving 9-in. Pyrex contact cylinder which provides almost perfect contact.

The "55" printer is made for two currents—220 volts a.c. 60 cycles, or 220 volts a.c. 50 cycles. Operating electrical requirement for the entire machine is only 3,800 watts.

## TRADE LITERATURE

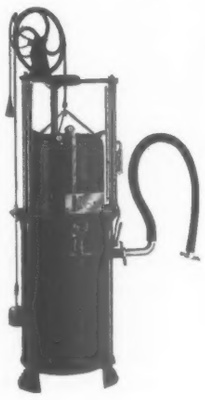
RALPH N. BRODIE CO., INC., 959 Sixty-first Street, Oakland, Calif.—Bulletin 142-C, a fully-illustrated 8-page bulletin analyzing the various causes of stock and time losses and describing the new developments in petroleum-marketing equipment. This comprehensive bulletin covers the use of meters on tank trucks, loading racks, and in other services, highlighting the specific advantages and applications of Brodie meters, counters, and meter accessories.

ALLIS-CHALMERS MANUFACTURING CO., Milwaukee, Wis.—Bulletin B-6137 on its Type VD rocking-contact voltage regulators. It is of vital interest to those engineers having applications involving control of voltage, current, speed, and tension in connection with direct-current machines. This descriptive bulletin, well illustrated by photographs and wiring diagrams, shows how these regulators may be applied to direct-current problems in steel mills, paper mills, electroplating and chemical plants, and in the process industries.

WORTHINGTON PUMP & MACHINERY CORP., Harrison, N. J.—Folder describing its centrifugal liquid-cooling systems, available in 42 sizes from 150 to 650 tons capacity, for chilling water in air-conditioning, chilling brine for industrial and other purposes. Units consist of a three-stage compressor, a water cooled condenser, and a horizontal shell-and-tube cooler of special design.

## New Emco Bell Prover Aids Meter Testing

To insure that the meters used in measuring gas are maintained at a proper degree of accuracy, a bell-type prover is used as a standard by most gas companies. The newly designed Emco Type 41 bell prover is said to provide a greatly refined mechanism of this type with many innovations and attachments to facilitate the proving operation.

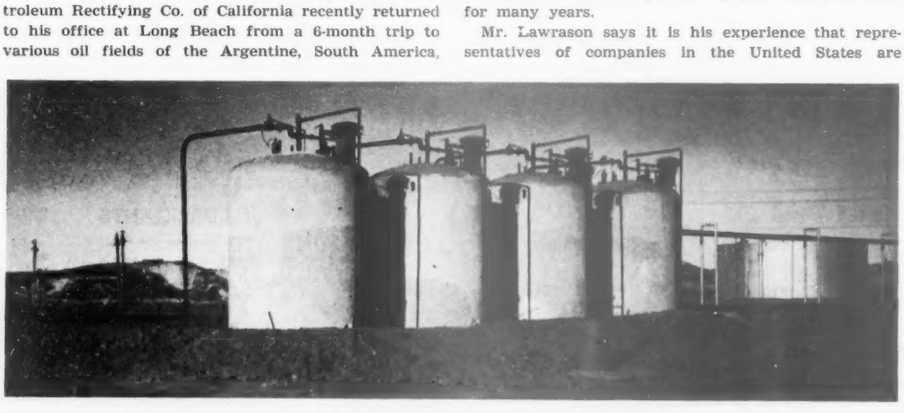


Among the features claimed by the manufacturer are the following: The bell is accurately guided at both top and bottom by friction-free rollers. A steel-cable-controlled counterbalance is used to reduce friction. Three-point adjustable bell suspension permits accurate bell alignment. Three dial-type thermometers are provided to record (1) temperature of the atmospheric air; (2) temperature of the air in the bell, and (3) temperature of the oil seal of the bell. Large airways and streamline fittings provide high capacity with a minimum change in pressure. There is a large, plainly marked straight scale with "sped-up" magnified scale at the main divisions to facilitate close reading.

The Emco Type 41 bell prover as well as other meter-testing equipment is described in Bulletin 1066. Copies can be obtained by writing the Pittsburgh Equitable Meter Co., at 400 North Lexington Avenue, Pittsburgh, Pa.

## PETRECO ENGINEER RETURNS FROM SOUTH AMERICAN TRIP

Levering Lawrason of the engineering staff of Petroleum Rectifying Co. of California recently returned to his office at Long Beach from a 6-month trip to various oil fields of the Argentine, South America, where he assisted in the modernization of many Petreco electromatic dehydrating plants in use in that territory.



*Four-unit Petreco electromatic dehydrating plant at Caleto Cordoba Chubut, Argentina*

Among the fields visited by Mr. Lawrason were Comodoro Rivadavia, one of the oldest producing areas in the Argentine and located about 1,000 miles south of Buenos Aires; Mendoza; and a La Plata refinery where the Petreco dehydration process has been used for many years.

Mr. Lawrason says it is his experience that representatives of companies in the United States are cordially welcomed by South American operators, and that every cooperation possible is extended by the operators. He was given permission to photograph many Petreco plants in service, of which one is reproduced here, as well as other oil-field views. He expects to make another trip of this character during the present year.

## FWD Introduces New Styles In 1941 Truck Design

The trucking industry will see the introduction of a complete line of newly styled FWD trucks for 1941. Attractive new general design and major mechanical improvements that increase the performance of the truck; lighter weight and greater accessibility are features of the 1941 line. The newly designed models of the lighter "H" series are already available and refinements in some 15 other FWD models will soon be announced.

The attractive new styling features horizontal radiator louvers with a radiator shell separate from the core, a frame that is tapered only on the under side on the front and rear and refinements in the engine and transfer case. Cab appointments, including an adjustable seat and refinements in the location of instruments, provide greater driver comfort and greater visibility. The newly designed skirting in the front of the fenders serve a dual purpose, protecting the radiator grill and fenders, and also acting as a bumper. These new advancements in styling combine both attractiveness and practicability to make the FWD a standout among 1941 truck models.

Of special interest is the provision made for use of optional engines which in the "H" series allows for engines from 85 to 113 hp. Two series of axles are also available in these trucks, to take gross loads up to 20,000 lb. The transfer case is arranged so that a power takeoff can be installed that will utilize all the speeds of the transmission and the full torque of the motor for earth-boring machines and similar services.

Besides the major changes mentioned above, the 1941 models will embody many improvements that have been developed in FWD's plant in Clintonville,

Wis., during the past few years. Included in these developments are a new FWD manufactured axle for the "H" series and a power-proportioning differential for four and six-wheel-drive trucks which divides the power in the center of the truck to each axle in proportion to its normal loaded weight. Of special interest to heavy-duty-truck operators is the new 10-speed transmission, also of FWD manufacture.

All models are furnished in both conventional and cab-over-engine design, provision being made for from two to seven passengers in the driver's compartment.

## New Method of Pressure-Welding Drill Pipe Offered by Hydril

A new method of fabricating new drill pipe and of reconditioning used drill pipe by welding on alloy-steel tool-joint members, designated the "Pressure-Weld Process," is offered by the Hydril Co., with service available at its factories at Houston, Tex., and Torrance, Calif. Any type of drill pipe, either externally upset, externally and internally upset, or internally upset, can be fabricated or reconditioned, and any type of thread and tool-joint connection of either standard or any oversize dimensions, can be supplied.

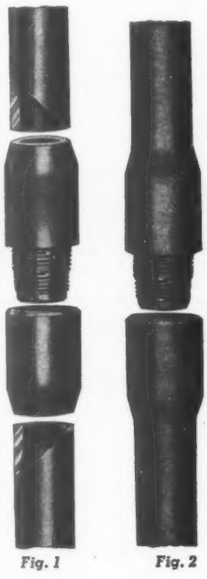


*Fig. 1* *Fig. 2*

***Fig. 1—Drill pipe and tool-joint members before pressure welding. Fig. 2—Finished Hydril pressure-weld drill pipe***

It has been found that abrasion by the formation and rig wear often impair the service of the tool-joint connections of drill pipe while the pipe itself is still in safe condition for drilling. The pressure-weld process, as applied to reconditioning the drill pipe, consists of cutting off the ends of the pipe, leaving a short section of the upset, the end surface of which is machined flat and highly finished, (Fig. 1). A heavy alloy-steel box or pin blank is then welded to the pipe under controlled, uniform conditions of pressure and temperature.

The welding operation is performed in automatic machines especially designed and constructed for this work. These welding machines incorporate chucks which hold and rotate both the drill pipe and tool joint blank in accurate alignment all during the welding process, fixed rings of gas torches which heat the area of the weld both internally and externally before and during the formation of the weld, and powerful hydraulic jacks which unite the surfaces under pressure when welding temperature is reached. As is well known, welding takes place at low heat when high pressure is used. The low heat employed in the pressure-weld process does not break down the structure of the metal, and no metal is supplied from an outside source. Hence, the common weaknesses of welding such as brittleness, production of slag, and inclusion of foreign material in the weld are avoided. Controlled cooling follows the welding operation. After welding, the joint is turned and bored to proper dimensions, threaded, and given a final refining heat treatment.

One style of finished pressure-weld joint is shown in Fig. 2. This pin-to-box connection is a popular type employed in pressure-weld reconditioning of A.P.I. internal-upset drill pipe, Hydril Types "IF" and "EIU" drill pipe, and others. The new heat-treated alloy-steel tool-joint connections can be of any desired oversize dimensions to provide for formation wear, and offer the same resistance to rig wear as any other tool joints.

## New Nomenclature Maps

E. C. Jacobson, McBirney Building, Tulsa, originator of "Official Nomenclature Maps," has published two new maps of Kansas and Oklahoma. These maps are on a scale of 1 in. equals 8 miles, showing oil fields in green, gas fields in red, with indexes giving location of each field and official names as designated by the nomenclature committee of the Mid-Continent Oil and Gas Association. Also shows townships, ranges, county seats, cities, and towns. Size 35 by 55 in.

The Kansas map has been enlarged to show western Missouri and Falls City area in Nebraska, the Oklahoma map, to show North Central Texas. The above maps are also obtainable on a scale of 1 in. equals 16 miles.

## Revised Code for Tubular Heat Exchangers

A revised tentative code for mechanical design, construction and inspection of tubular heat exchangers has been prepared by a committee of refiners. Copies of this code can be obtained at 40 cents each from the office of the secretary of the committee, W. J. Parker, 366 Madison Avenue, New York.

## Lane-Wells Issues New Electrolog Bulletin

Lane-Wells Co. has issued a new bulletin, "Lane-Wells Electrolog," which is a complete story of electrical logging of uncased hole. This bulletin is designed for use by oil-company field personnel and gives a description of the electrical characteristics of formations and of the different potential and resistivity curves used to make a complete well log. Typical electrolog records are shown from different oil-producing areas. Electrolog applications to structural problems, completion problems, exploitation and production problems are discussed at length. Electrolog field equipment is illustrated and described. Diagrams explain the field setup and curve recording.

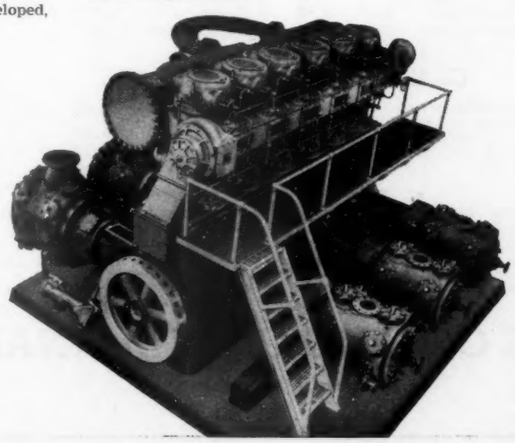
Copies of "Lane-Wells Electrolog" are available through any Lane-Wells branch office or by writing to Lane-Wells Co., 5610 South Soto Street, Los Angeles, Calif.

## CLARK INTRODUCES STEAM-DRIVEN "ANGLE" COMPRESSOR

Due to the need in the industrial, chemical, and petroleum fields for large-size, steam-driven compressors, Clark Bros. Co., Inc., of Olean, N. Y., has developed, based on its famous right-angle design of gas engine-driven compressor, a line of steam-engine-driven "angle" compressors which can be furnished in sizes from 600 to 4,000 hp. The new compressors have three to six power cylinders and a corresponding number of compressor cylinders in practically any arrangement desired.

The Clark right-angle design for compressors has met with universal approval. In the 4 years since they were introduced, Clark gas-driven "angles" have set a new sales record for compressors, with approximately 500,000 hp. sold.

The power ends of these units are equipped with Unaflow steam cylinders and are noted for their economical operation. The particular features of this compressor are small floor-space requirements, low foundation and building costs, economical steam rates, flexibility and minimum maintenance costs due to the smallness of the parts.



# AMONG EQUIPMENT MEN

## H. C. Eddy Made Vice President, General Manager of "Petreco"

Announcement has been made of the appointment of Harold C. Eddy to the position of general manager of Petroleum Rectifying Co. of California.

In length of service, Mr. Eddy is the oldest member of the Petreco organization, having been with the company for 27 years. He is a graduate of Colorado School of Mines and one of the pioneers in crude-oil dehydration work. For the past few years he has been actively engaged in developing and perfecting the Petreco electrical desalting process. He is the author of numerous articles and papers on crude-oil dehydration and desalting and is recognized as one of the leading authorities on these subjects. Numerous patents covering improved processes and apparatus have been issued to him. His work with the company has kept him in close touch with all phases of the business, including field work, research, engineering and business administration.

Mr. Eddy enjoys a wide acquaintance throughout the oil industry and his many friends will be gratified to learn of his advancement.

## BUSINESS NOTES

S. Merton McMahon has recently become associated with Pittsburgh Steel Co. as salesman for oil-country tubular goods in the eastern oil-producing states. Mr. McMahon was several years associated with National Supply Co. in Ohio and Illinois and later with Continental Supply Co. in Texas. His headquarters will be in Pittsburgh, Pa.

It was announced that E. S. Weaver joined the wire-rope sales division of the Jones & Laughlin Steel Corp., with headquarters in Tulsa. Prior to coming with Jones & Laughlin, Mr. Weaver was associated for 12 years with J. A. Roebling & Sons Co., with headquarters from 1929 until 1931 in Tulsa, and from 1931 until 1940 at Houston, Tex.

J. M. Cullens, president, and C. E. Wright, sales manager, of the Buda Engine Sales & Service, Inc., have just returned from a trip of 2 weeks' duration, during which time they visited its store in Illinois, the Diamond Chain & Manufacturing Co.'s plant at Indianapolis, Ind., and the Buda company's plant at Harvey, Ill. During their trip north, Mr. Cullens and Mr. Wright also visited the Onan Electric Co.'s plant at Minneapolis, Minn.

F. H. Lindus, formerly Los Angeles, Calif., branch manager in charge of the service-sales division of the Timken Roller Bearing Co., has been transferred to the home office at Canton, Ohio, where he is engaged in general sales promotional work. L. J. Halderman, branch manager of the service-sales division of the Chicago office, has taken Mr. Lindus' place in the Los Angeles branch office, while Jack Gelomb, formerly Detroit, Mich., manager of the service-sales division, has filled the vacancy in the Chicago office. Joe Jesseph, resident salesman in the Portland, Ore., branch, has taken Mr. Gelomb's place in the Detroit office.

# CLASSIFIED ADVERTISING

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### Leases and Drilling Blocks

LEASES—East Texas, La., South Ark. 20 acres up, dollar acre up.—Owners—Address Attorney. Box 1122, Little Rock, Ark.

EAST TEXAS Woodbine-Trinity sand wildcats starting. Leases afford 10 to 50 for 1 bet. Has already happened past 60 days. E. CROFT, PROCTOR, TEXAS.

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STATE OIL AND GAS LEASES
Another block in a NEW HOT SPOT. This is a good bet. Buy direct and save those dollars. No middle man to pay; no salesmen to bother you. Better buy a little of something, than a whole lot of nothing.
HARRY S. WRIGHT
New Mexico State Lessee
Farmington, New Mexico

FOR SALE Oil and gas leases and small production located in Kentucky shallow field, also tracts of proven Fluorspar and zinc deposits. Reports on request. W. P. HARLEY, Bowling Green, Kentucky.

**INVESTIGATIONS, REPORTS AND MAPS**
**On producing or nonproducing oil land in Louisiana. Nominal fee.**
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Oil and Gas Leases and Royalties
ROY G. BARTON, Hobbs, N. M.

GET AHEAD of the big play with this new 10 year, 34 acre lease, directly between the big Joaquin field and the Shelbyville wells, $5 per acre. Map furnished on request. C. A. Parker, Box 451, Center, Texas.

WANTED to buy oil production in Mid Continent or Illinois. Address Box A-381, The Oil and Gas Journal, Tulsa, Okla.

HAVE SEVERAL blocks 1000 to 5000 acres oil and gas leases, selected by four best Eastern Kentucky geologists, forty or more salt well tests made, every one showing oil and gas. Seven thick stratas within 1200 feet surface, no better shallow acreage can be found. Will sell offsets, share drilling costs, farm out, or sell to responsible parties; have maps and geology.
THE OIL AND GAS PRODUCING CO.
Columbia, Ky.

FOR LEASE 9 patented gold claims near Boulder, Colorado. Electric power. Complete equipment for operations. Property in splendid shape. Ready for immediate operation. Address Box A-342, The Oil and Gas Journal, Room 1404, 105 W. Madison St., Chicago, Ill.

### Leases and Drilling Blocks

HOMER L. FITCH, GEOPHYSICIST AND LOCATION ENGINEER
WHY drill dry holes? Our method only locates structures which contain oil or gas. Drawer 711, Brownsville, Texas.

FOR SALE, 160 acre lease off-setting 20 year production. Eastern Kansas. Bartlesville Sand 800 feet deep. Pipe line market. No pro-ration, sell all you produce. Will sell lease or assign with well completed. Also have some leases ideal for water flooding. 600 acres proven gas with .25 ct. market. Write stating type project interested in. H. B. Snyder, Box 126, Ottawa, Kansas.

WANTED, name and address of practical driller owning his own drill, capable of drilling two to four thousand feet. Address T. L. Rice, Ames, Iowa.

U. S. OIL RESERVE lands can be filed for lease on limited acreage by American Citizens. Want several join me in filing block in developing Rocky Mountain Area. Big opportunity. Small expense. Box A-346, The Oil and Gas Journal, Tulsa, Okla.

### Mailing Lists

ROYALTY owners, Oil Investors, Unit holders, Stockholders in Oil and Royalty Companies. Personnel lists of every branch of oil industry. All by States. We buy lists. New catalogues ready. Oil Industry Mailing List Co., Tulsa Loan Bldg., Tulsa, Oklahoma.

LISTS. All kinds of Oil and Mining lists. By States. Pamphlet. Flory Company. Box 105. Fort Worth, Texas.

### Incorporations

DELAWARE CHARTERS: Complete service $35. Submitted forms. Chas. G. Guyer, Inc., Wilmington, Delaware.

CAPITAL SEEKERS
Put your project before 260 Key-Men. Cost trifling. Details free. AMSTER LEONARD, Fox Theater Building. Detroit, Michigan

### Geologic Survey

GEOLOGISTS—SURVEYORS
Looking for U. S. or State Geologic Surveys, or other government publications? Write Cornwall's Book Store, 723 Eleventh Street, Northwest, Washington, D. C. Unusually large stock.

### Royalties

ANDREW J. BARRETT
The Philtower
Tulsa, Oklahoma

**Brokers—Salesmen**

Sell in the most active area in the United States—The Permian Basin of West Texas and Southeastern New Mexico. From the standpoint of royalty investors this area has much to offer. Can supply you with choice non-producing royalties located on geophysical highs. Also drilling blocks, close in acreage to production, or wildcat leases. I maintain my own field men who cover this area for me. All offerings meet the requirements of the Security and Exchange Commission. Inquiries invited.

**B. D. BUCKLEY**
Paul Brown Bldg., St. Louis, Mo.

WILL purchase royalties, on land in Illinois. Must first be given right to test land with my method, which quickly eliminates non-mineral formation. This test is done without charge and free from any obligation on part of owner of land. Not interested in brokers offers. Address Box A-268. The Oil and Gas Journal, Room 1404, 105 W. Madison. Chicago, Illinois.

SALESMEN experienced handling Royalties can make good connection by writing to Box A-360, The Oil and Gas Journal, Tulsa, Okla.

### Situations Wanted

MECHANICAL Engineer, 7 yrs. experience in plant engineering, maintenance and inspection in large refinery. Univ. Grad. Box A-372, The Oil and Gas Journal. Tulsa, Okla.

CHEM. Eng. 10 yrs. experience in Refining of Lube Oils, Waxes, etc. Supervisor & Process Eng. Add. Box A-330, The Oil and Gas Journal, Tulsa, Okla.

### Situations Wanted

ACCOUNTANT-Office Manager, experienced in oil industry, capable of taking full charge, desires permanent connection with firm offering opportunity for advancement. Box A-350, The Oil and Gas Journal, Tulsa, Okla.

OIL Equipment Salesman, with proven sales ability and well acquainted with refiners and producers on Gulf Coast, seeks connection. Draft Exempt. Excellent References. Box A-370, The Oil and Gas Journal, Tulsa, Okla.

ENGINEER Construction—12 years' experience refinery, gasoline plant, pipe line construction. Returned February 1st from construction job South America. Qualified refinery operation. Desirous making connection in construction, operation or in sales of equipment or machinery in the U. S. or South American territory. Age 35 years. College. Write or wire Box A-374, The Oil and Gas Journal, Tulsa, Okla.

LAND, LEASE, TITLE-MAN: 10 years' experience in Oklahoma, Kansas, Illinois. Past 2 years in Illinois with large major company. Presently employed, desire change. Experienced in lease and royalty buying, pipe-line work, damage settlements. Expert title-man and typist. Age 37. Married. Can furnish car. Best references. Box A-382, The Oil and Gas Journal, Tulsa, Okla.

CHEMICAL ENGINEER, 11 years experience in petroleum refinery equipment design and process development. Now employed. Box A-383, The Oil and Gas Journal, Tulsa, Okla.

EXPERIENCED equipment salesman in both oil and industrial trade, seeks connection to travel Mid-Continent. Good references. Draft exempt. Mr. Buck, Box 3089, Houston, Texas.

### Help Wanted

WANTED for sales work in Mid-Continent territory. Technically trained engineer with practical experience in design, field or shop. Age 25-35. Give full details in reply which will be treated confidentially. Address Box A-362, The Oil and Gas Journal, Tulsa, Oklahoma.

WELDING Engineer, graduate metallurgist with experience in fabrication procedure and welding practice. State acceptable salary. Battelle Memorial Institute, Columbus, Ohio.

CHEMIST for small refinery. Give references, state age, if married, and wages expected. Terry Carpenter, Inc., Scottsbluff, Neb.

CHEMICAL ENGINEER wanted for Engineering Department of large eastern manufacturer. Must have thorough knowledge of petroleum distillation and cracking process chemistry and analysis. Prefer at least 5 years research and laboratory experience in this field, with another five years refinery design, installation and maintenance. Heat exchanger experience desirable. Job will involve design and development methods and equipment. Enclose photograph and give full details of personal data, education, nature of experience and salary expected. Replies will be considered confidential. Box A-380, The Oil and Gas Journal, Tulsa, Oklahoma.

### Oil Industry Printing

OIL FIELD LEGAL BLANKS
Leases, assignments, releases, township plat books, well records, etc. Request on your letterhead gets free catalog. Olds Press, 215 East Third St., Tulsa, Okla.

### Equipment Wanted

WANTED — One twin and two single eighty horsepower Cooper type 80, or equivalent, gas engine compressors with type C compressor cylinders to take liners for 14" pistons. Give complete description and location in reply to Gas Service Company, Kansas City, Missouri.

WANTED—One direct connected, angle type, gas engine driven, air compressor unit, 100 to 250 H.P., maximum speed 350 R.P.M., 125# air pressure. Hercules Gasoline Company, 530 Giddens-Lane Building, Shreveport, La

## CLASSIFIED ADVERTISING RATES

Classified advertising rates: First insertion, 35 cents a line; each additional insertion, 25 cents a line, PAYABLE IN ADVANCE. Six words usually make a line. Count as a word each one-letter word and each group of figures. White-space computed at regular line rate. Allow two extra lines for blind ads. Ads of less than three lines not accepted. No formal acknowledgment is made, and proofs cannot be shown in advance of publication.

| | 1 time | 2 times | 3 times | 4 times |
|---|---|---|---|---|
| 3 Lines | $1.05 | $1.80 | $2.55 | $3.30 |
| 4 Lines | 1.40 | 2.40 | 3.40 | 4.40 |
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| 6 Lines | 2.10 | 3.60 | 5.10 | 6.60 |
| 7 Lines | $2.45 | $4.20 | $5.95 | $7.70 |
| 8 Lines | 2.80 | 4.80 | 6.80 | 8.80 |
| 9 Lines | 3.15 | 5.40 | 7.65 | 9.90 |
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| 1 Inch | 1 time | $5.00 |
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| 1 Inch | 26 times | 4.00 per inch |
| 1 Inch | 52 times | 3.50 per inch |

This space may be contracted for over a period of one year from the date of the first insertion and is PAYABLE IN ADVANCE, MONTHLY.

We reserve the right to withhold all advertising of questionable character. To avoid delay be sure to send remittance with copy. We will set your ad in the smallest amount of space possible and refund all overpayments. One-time insertions will not be run until fully paid. Forms close MONDAY NOON before each issue date.

**THE OIL AND GAS JOURNAL**
**Tulsa, Oklahoma**

FOR SALE: At our Oklahoma City warehouse slightly used Cardwell KS DHS skid type oil well servicing unit equipped with DHK Waukesha motor. I. T. I. O. Co., Bartlesville, Okla.

**FOR SALE**

One gasoline drilling rig with two 85 H.P. Waukesha motors and unitized draw works complete.

300 sets 3" A.P.I. tool joints.

10,000 Ft. 7" O.D. 26# seamless casing, once run.

15,000 Ft. 4½" O.D. seamless drill pipe equipped with both regular and full hole tool joints.

In addition to the above we have 20,000 Ft. of 6" screw line pipe in Oklahoma; also drilling rig capable of drilling to 6500 feet, complete stock of line pipe, casing, drilling and pumping equipment.

Wire, Write or Phone for Prices.

**Louisiana Iron & Supply Co.**
**Shreveport, La.**

FOR SALE—At Seminole, Oklahoma—1 8' diameter X 26' gasoline steel storage tank. I. T. I. O. Company, Bartlesville, Oklahoma—$200.00.

FOR SALE: Keystone drilling rig with tools; mounted on 5 ton White truck. Good condition. Bargain at $1350. C. I. BREEDING, Glasgow, Kentucky.

FOR SALE—Gasoline Plant Equipment—Machinery, Tanks, Boilers, Meters, etc. GILBERT PIPE SUPPLY, Electra, Tex.

FOR SALE AT OKLAHOMA CITY: 4—14" x 7¼" x 14" Ideal Union steam slush pumps. $500.00 each. I.T.I.O., Bartlesville, Okla.

FOR SALE
1—⅛" to 4" Bignall & Keeler Pipe Threading Machine.
1—4" to 12" Bignall & Keeler Pipe Threading Machine.
Both machines direct motor driven and have complete range of dies.

HUTCHINSON PIPE & SUPPLY COMPANY
900 N. Main St.,
Fort Worth, Texas.

FOR SALE: At Oklahoma City 3"—4"—6"—7"—8"—10"—16", 20" victaulic—couplings less rubbers—cheap—I.T.I.O., Bartlesville, Okla.

FOR SALE OR RENT: Gas engine powered Rotary Drilling Rig complete. Suitable for 4,500' drilling. Box 1360. Phone 312, Seminole, Okla.

TO BE SOLD BEFORE MARCH 15, 1941: The Orr & McCullough properties located north east edge of the City of Braman, Kay County, Oklahoma. Five (5) Wells—small production. Equipments include Derricks, Casings, Engines, Rig Fronts, Tanks and Separators, and miscellaneous Equipments and Supplies. Bids will be accepted. The right to reject any and all bids is reserved.

For further information and inventory, write to or call The O. & M. Oil Company, P. O. Box 730, Wichita, Kansas, Phone No. L.D. 244.

FOR SALE: 1—Ideco Portable Standard Rig suitable for drilling, pumping, or servicing, complete less motor. I.T.I.O., Bartlesville, Okla.

**TRACTORS**

Caterpillars, crawler type, size "35" $375; size "65" with nigger head winch $750; Caterpillar RD8 with Letroneau bulldozer, $2000; and Allis-Chalmers, Model L, with Baker bulldozer $1850. Perfect condition. O. C. Evans, Mount Sterling, Kentucky.

FOR SALE: Now erected in Oklahoma City field, 50—1500 barrel 2 ring flat seam 12 gauge used oil storage tanks, $175.00 east. I.T.I.O., Bartlesville, Okla.

LIGHT plants, electric motors, generators, other equipment. HARGETT ELECTRIC CO., 1811 N. Harwood, Dallas, Tex.

FOR SALE at Bartlesville: 1 set shear poles. Complete for National Drilling Machine. I. T. I. O., Bartlesville, Okla.

2300'—2½" upset range 1 tubing, 15 cents per foot, Melton Supply Co., Seminole, Okla.

FOR SALE: Erected in Oklahoma City field, 15—500 Bbl. used BS&B VP bolted tanks, $75.00 each. I.T.I.O. Co., Bartlesville, Okla.



# SPECIAL PIPE OFFERING—REFINERY EQUIPMENT

**16,000 Feet—3" STD WT—T&C Line Pipe—75,000 Feet—4" STD WT—T&C Line Pipe Cleaned and Racked at Breckenridge, Texas**

**Send Us Your Refinery Equipment Requirements—Dismantling Barnsdall Refinery—Okmulgee, Oklahoma**

***Also Large Stock Maintained in Our Tulsa Yard***

## SONKEN-GALAMBA SUPPLY COMPANY

W. C. Berry and H. J. Galamba
Riverview at Second, Kansas City, Kansas

Robt. W. Duden
2100 S. Union, Tulsa, Oklahoma

FOR SALE AT SEMINOLE AND OKLAHOMA CITY: 10—Low pressure "Tulsa" open type gas coolers. $50.00 each. I.T.I.O., Bartlesville, Okla.

NOTICE — CABLE-TOOL CONTRACTORS. Save money; good used wire lines. All sizes up to 5,000 ft. long. See us before you buy. General Tool & Supply Co., P.O. Box 4387, Oklahoma City, Oklahoma.

FOR SALE
1 7¼ x 14 Oil Well Power Pump.
1 7¼ x 14 Type B Ideal Power Pump.
2 225 H.P. Buda Gas Drilling Engines.
GENERAL MACHINE & SUPPLY CO.
Wichita Falls, Texas.

FOR SALE: Erected at Oklahoma City, 1—type T-19-3B Pritchard atmospheric jacket water cooling tower erected in 3000 barrel open flat seam bolted steel tank. $750.00. I.T.I.O. Co., Bartlesville, Okla.

25 K.W. and 40 K.W. Gas Engines, 220 volts, D.C. Two 100 K.W. Gas Engine-Generator Sets, 220 volts, D.C. 7x6 Ingersoll-Rand ER-1 Air Compressor. Six-inch Oster Pipe Threading Machine. Also large stock of lathes, pipe machines, milling machines, etc. Send for our list.
Terms to suit.
CINCINNATI MACHINERY & SUPPLY CO.
26 West 2nd St., Cincinnati, Ohio

FOR SALE: Westinghouse Generator, 110 volts, D.C., 7 K. W., 800 r.p.m. Drake Electric Service, Marshall, Illinois.

FOR SALE AT WYNONA, Oklahoma: 1-Twin and 2 single type 80 Cooper 4 cycle gas engine compressor with single acting cylinders. I.T.I.O., Bartlesville, Okla.

LARGE QUANTITY new engineers end and socket wrenches. Substantial discount. Lucey Products Corporation, Tulsa, Okla.

FOR SALE — At Oklahoma City — 11 6" and 8" Byron-Jackson built-in motor pump heads for use in operating deep-well turbine pumps. I. T. I. O. Company, Bartlesville, Oklahoma.

FOR SALE: One large, used Ideco pumping unit and engine complete. Call 2984 or write
W. C. CARPENTER
510 W. 10th St., Hutchinson, Kans.

FOR SALE: 6—40 gallon foam—outdoor type mounted fire extinguishers. Also 34—5 gallon foam type. I.T.I.O., Bartlesville, Okla.

STEAM SLUSH PUMPS: 5—18" Luceys, 2—18" Johnson "G," 1—14" Ideal. Lucey Products Corp., Tulsa, Okla.

1100'—4½" x 30' seamless drill pipe, 60 cents per foot. Melton Supply Co., Seminole, Okla.

FOR SALE: 4—OCS Roller Bearing Chain Driven Sand Reels. I. T. I. O., Bartlesville, Okla.

HAVE Rotary tools and equipment with 4 inch A.P.I. regular drill pipe, will trade for good producing oil payment or royalty. No wildcat. Address Box A-351, The Oil and Gas Journal, Tulsa, Oklahoma.

BOILERS: 3—85 HP, 225# WP Acme. Ideal for Lease or Plant. Lucey Products Corp., Tulsa, Okla.

FOR SALE: At Oklahoma City—9—80 HP 180 RPM 2 cycle type "10" Bessemer Engine Compressor units with tandem cylinders. I. T. I. O. Company, Bartlesville, Oklahoma.

FOR SALE: 5—Steam Rotary Rigs complete less drill pipe. 15—250#-300# Pressure Boilers, 5—12" x 12" Twin Cylinder Steam Engines, 5—Drawworks, unitized, with automatic cathead, 5—Rotaries, 4—25½ Emsco, 1—26" Ideal, 10—10 x 4½ x 10 Worthington Boiler Feed Pumps on steel skids. 5—Generators, 5—Traveling Blocks, 5—Crown Blocks, 5—Swivels, 5—38' Kelleys, Tongs, Elevators, Weldless Links, and Misc. Material—Tool Houses, Tool Boxes, Engine Substructures and Etc. Above used material is complete and intact. Will sell all or any part. UNITED SUPPLY & MFG. CO.—Tulsa, Okla.

FOR SALE: At Bartlesville 1—2A National Portable Drilling Machine Less Tools. I. T. I. O. Co., Bartlesville, Okla.

FOR SALE by owner, Complete Standard Cable Tool Rig—Especially equipped for wildcat work. Steel derrick, bull and calf wheels. Bits 6 to 15 inches. 65 hp. Boiler—12 x 12 Engine. All necessary drilling and fishing tools. 5500 feet ⅞ drilling line also same amount bailing line, practically new. Locate on highway in Nassau County, Florida. Address J. Eugene Brown, Arragon Hotel, Jacksonville, Florida.

FOR SALE AT OKLAHOMA CITY: 1—12 x 12 gumbo buster twin steam engine, $250.00. I.T.I.O., Bartlesville, Okla.

FOR SALE: 14" x 18" twin Tico gas engine, with 125 k.w. generator, 2,300 v.t., belt driven. P.O. Box 604, Oil City, Pa.

FOR SALE
2—Cooper Bessemer 110 H.P. direct driven engines and twin compressors.
1—Miller 110 H.P. direct driven engine and twin compressor.
2—Bessemer 80 H.P. direct driven engines and compressors.
2500' of 6⅝" 17 pound casing.
900' of 6¼" 13 pound casing.
40,000' of 5½" Odee P.E. linepipe.
5,000' of 3" standard eight thread linepipe.
1,000' of 10" 45 pound casing.
1,200' of 8" 28 pound casing.
All above located our yard.
THE VEEDER SUPPLY & DEVELOPMENT COMPANY
Cherryvale, Kansas

FOR SALE: Oklahoma City. 150—8" Dresser—Dayton Long Sleeve Couplings less Rubbers. I. T. I. O., Bartlesville. Okla.

INTERNATIONAL Supply Company geared pumping unit for 3000'-4000' wells, complete with power, $1290.00. Melton Supply Co., Seminole, Okla.

FOR SALE AT OKLAHOMA CITY—2—6' diameter 38' high 16 tray Southwestern Eng. absorbers. Ser. #6389-90. $1,000.00 each. I.T.I.O. Co., Bartlesville, Okla.

### Ranches—Farm Lands

7,310 ACRE ranch $10.50 per acre, 17 miles west Seagraves, Texas, on hard surfaced road, fenced, abundance water. 200 acres cultivation, could be cut into farms, as 7,000 acres would make good farm land. Part of mineral rights reserved. Two producing oil wells recently completed on land, 841 bbl. and 967 bbl., respectively. Three-fourths of mineral rights under the two producing oil wells goes with land. Terms $65,000.00 Cash. Balance low rate interest. The land less the oil income is an attractive buy. No trades. Brokers do not answer, as no commissions will be paid. Lee R. Slater, R. F. D. #1, Plains, Texas.

### Legal Blanks

BURKHART'S legal blanks and general forms serving Mid-Cont. oil field since 1908—Okla. Kans. N. Mex. Tex. Ala. Ark. Fla. Ga. Ill. Ind. Ky. La. Mich. Miss. Mo. Neb. N. Dak. Tenn. Wyo. Free catalog samples on request. Burkhart Ptg. & Sta. Co., 115 S. Cinn., Tulsa, Oklahoma.

## CRUDE-OIL PRICES IN REPRESENTATIVE FIELDS

Complete crude-price schedules are now being published in the first issue of each month. The last complete schedule was published in the February 6 issue. All changes in crude-oil-price schedules will be published completely in the first issues following the announcement of the changes. Following are representative crude-price schedules in barrels (42 gal.):

| | |
|---|---|
| East Texas | $1.10 |
| Conroe | 1.27 |
| Tepetate, Louisiana | 1.03 |
| Smackover, Arkansas, heavy | .73 |
| Illinois basin | 1.15 |
| Pecos County, Texas | .78 |
| Lance Creek, Wyoming | .77 |
| Bradford, Pennsylvania | 2.15 |

### Gravity Schedules

Top prices include all gravities above grades designated, and low prices include all gravities below grades designated:

| | Signal Hill, California* | Oklahoma, Kansas | Gulf Coast, Texas |
|---|---|---|---|
| 14-14.9 | $0.65 | .... | .... |
| 15-15.9 | .65 | .... | .... |
| 16-16.9 | .65 | .... | .... |
| 17-17.9 | .65 | .... | .... |
| 18-18.9 | .65 | .... | .... |
| 19-19.9 | .69 | .... | $0.86 |
| 20-20.9 | .73 | $0.70 | .88 |
| 21-21.9 | .78 | .72 | .90 |
| 22-22.9 | .82 | .74 | .92 |
| 23-23.9 | .86 | .76 | .94 |
| 24-24.9 | .90 | .78 | .96 |
| 25-25.9 | .95 | .80 | .98 |
| 26-26.9 | .99 | .82 | 1.00 |
| 27-27.9 | 1.03 | .84 | 1.02 |
| 28-28.9 | 1.07 | .86 | 1.04 |
| 29-29.9 | 1.10 | .88 | 1.06 |
| 30-30.9 | 1.14 | .90 | 1.08 |
| 31-31.9 | .... | .92 | 1.10 |
| 32-32.9 | .... | .94 | 1.12 |
| 33-33.9 | .... | .96 | 1.14 |
| 34-34.9 | .... | .98 | 1.16 |
| 35-35.9 | .... | 1.00 | 1.18 |
| 36-36.9 | .... | 1.02 | 1.20 |
| 37-37.9 | .... | 1.04 | 1.22 |
| 38-38.9 | .... | 1.06 | 1.24 |
| 39-39.9 | .... | 1.08 | 1.26 |
| 40-40.9 | .... | 1.10 | 1.28 |

*Effective February 1, 1940.

## Crude-Oil Price Changes

Root Petroleum Co. revised effective date of its higher postings in South Arkansas to February 15, instead of April 1 as originally announced. The company raised prices 4 to 10 cents per barrel for crude in the Schuler field, Union County, Arkansas.

## Gulf Coast Markets

*(Continued from Page 129)*

previously quoted prices. Several sources, however, continued to quote up to 80 cents. The fuel market continues to puzzle market observers. In the face of the fact that there is not believed to be an excessive supply of material and prospects are hopeful for a material increase in demand, sellers are finding it difficult to hold prices.

## Canadian Fields

*(Continued from Page 123)*

some time in March. Test runs have indicated a recovery of around 350 bbl. of oil from 400 tons of bituminous sand, the daily capacity of the plant. The oil will be refined in the McMurray plant and marketed in the northern mining areas.

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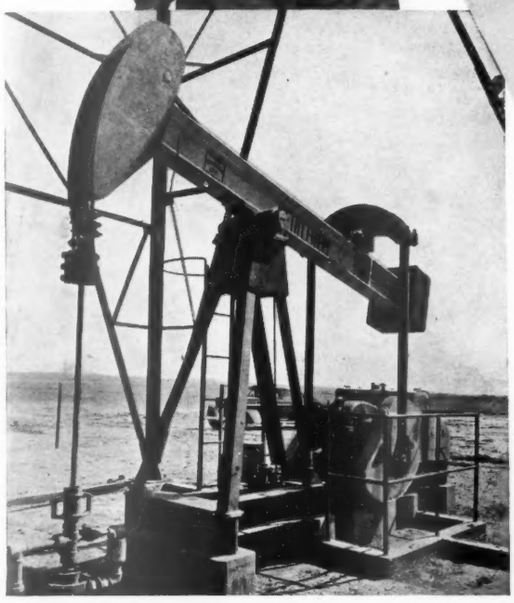
# They're designed SCIENTIFICALLY



One of the new Bethlehem Pumping Units Type 51-DT-10, hard at work on the Hall Pool field, Russell, Kansas

## to lower lifting costs

Throughout the Mid-Continent Field, scores of well operators have slashed lifting costs per barrel by specifying the new Bethlehem Pumping Units. Why? Because these Bethlehem Pumping Units have been scientifically designed for greater efficiency and more economical operation. Not a single feature has been overlooked, not a single refinement omitted that is needed to make a better-coordinated, more efficient, more dependable pumping unit.

Yet—despite all these outstanding features, Bethlehem Pumping Units are surprisingly moderate in price. They are easily and quickly installed on temporary or permanent foundations for simple or multiple pumping.

Get the complete facts on lower-operating-cost Bethlehem Pumping Units. Write today for the detailed bulletins on whichever of these types interest you:

| | | |
|---|---|---|
| 24-DT-5 | 51-DT-10 | 123-DT-14 |
| 36-DTA-7 | 51-DT-10RB | 123-DT-14L |

## No other unit has so many valuable features

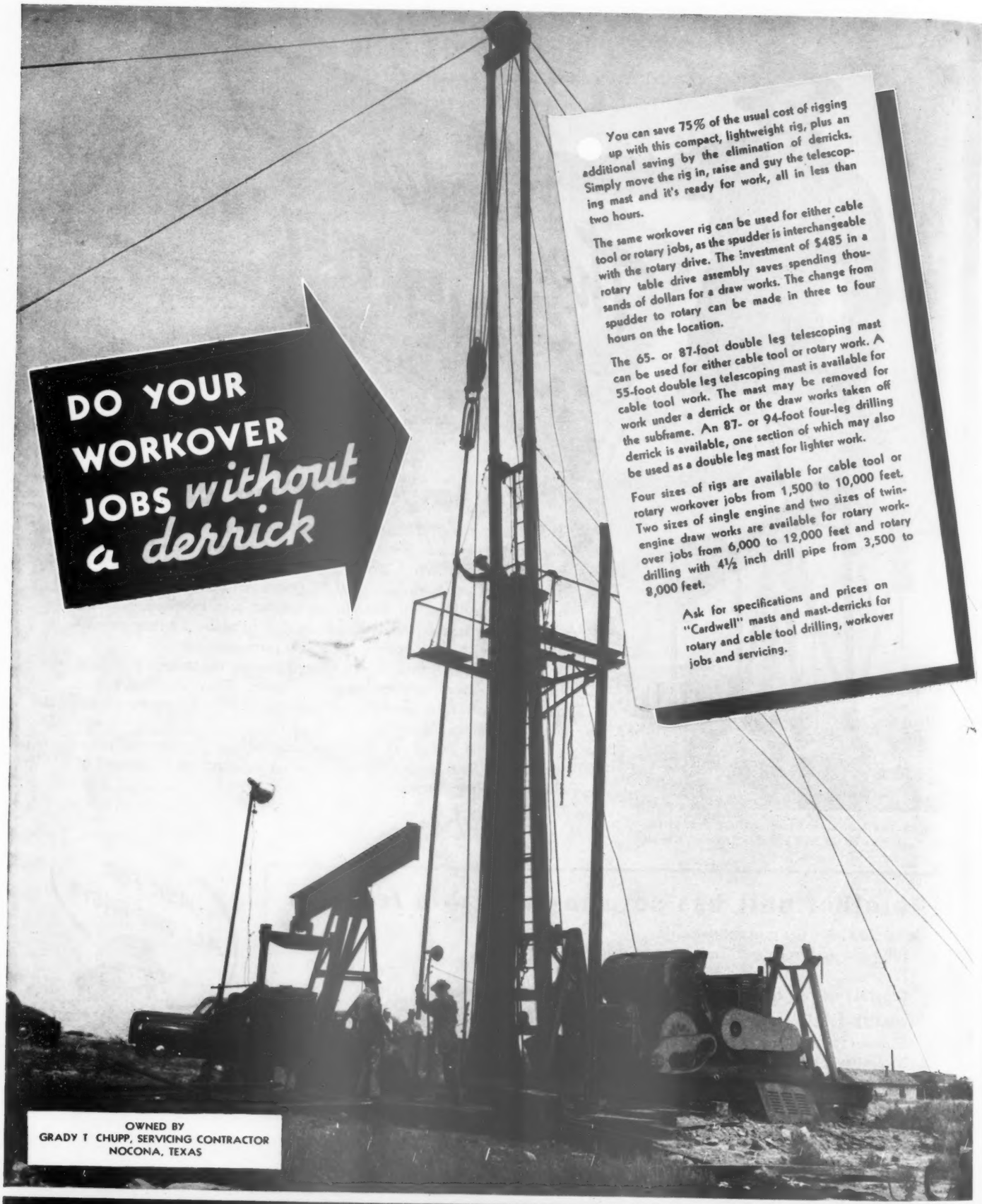
**Gear box:** 100 per cent roller bearing.
100 per cent forged steel heat-treated gears.
Huge shafts, heat-treated and ground to size.
Separate settling chamber for foreign matter and condensation.

**Structural:** Rubber mounting of upper pitman assembly.
Built-in true alignment by machining, not shims.
Multi-lived bronze saddle bearings in unitary mountings.
Safety-plus: rounded structural corners . . . central lubrication . . . ladder . . . 100 per cent belt covers . . . small counterweight sections . . . ample servicing clearances.

BETHLEHEM STEEL

## CALL BETHLEHEM SUPPLY COMPANY FOR SERVICE

Offices or Stores — *Illinois:* Grayville, Salem, St. Elmo; *Kansas:* Chase, Great Bend, Russell, Wichita; *Louisiana:* Houma, Lake Charles, New Iberia, Shreveport; *New Mexico:* Artesia, Hobbs; *Oklahoma:* Fittstown, Oklahoma City, Seminole, Tulsa, Wewoka; *Texas:* Alice, Borger, Corpus Christi, Dallas, Freer, Ft. Worth, Houston, Kemp City, Kilgore, La Ward, Midland, Odessa, Pampa, Seminole, Sundown, Wichita Falls.


DO YOUR WORKOVER JOBS without a derrick
You can save 75% of the usual cost of rigging up with this compact, lightweight rig, plus an additional saving by the elimination of derricks. Simply move the rig in, raise and guy the telescoping mast and it's ready for work, all in less than two hours.
The same workover rig can be used for either cable tool or rotary jobs, as the spudder is interchangeable with the rotary drive. The investment of $485 in a rotary table drive assembly saves spending thousands of dollars for a draw works. The change from spudder to rotary can be made in three to four hours on the location.
The 65- or 87-foot double leg telescoping mast can be used for either cable tool or rotary work. A 55-foot double leg telescoping mast is available for cable tool work. The mast may be removed for work under a derrick or the draw works taken off the subframe. An 87- or 94-foot four-leg drilling derrick is available, one section of which may also be used as a double leg mast for lighter work.
Four sizes of rigs are available for cable tool or rotary workover jobs from 1,500 to 10,000 feet. Two sizes of single engine and two sizes of twin-engine draw works are available for rotary workover jobs from 6,000 to 12,000 feet and rotary drilling with 4½ inch drill pipe from 3,500 to 8,000 feet.
Ask for specifications and prices on "Cardwell" masts and mast-derricks for rotary and cable tool drilling, workover jobs and servicing.
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GRADY T CHUPP, SERVICING CONTRACTOR
NOCONA, TEXAS
CARDWELL ALLSTEEL
THIS TRADE MARK INSURES HIGHEST QUALITY AT LOWEST PRICE
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# "A RECORD FOR CONSTANT OPERATION"

*Trouble-free turbine means trouble-free operation for prominent fuel company.*

*A case history showing the trouble-free service you can expect wherever you see the Coppus* **BLUE RIBBON**

"This turbine pump has performed 24 hours a day for more than three years and has never been shut down... is still operating 24 hours a day, and we have never had any maintenance cost of any kind on either turbine or pump. This is a record for continuous operation for any piece of machinery we have ever installed."

To insure consistently dependable operation of turbine-powered equipment, write "Coppus" on your specification. The "blue ribbon" painted on the flange indicates:

1. **PRECISION WORKMANSHIP**—controlled by Johansson size blocks.
2. **ENCASED GOVERNOR**—slow speed, leverless.
3. **SEPARATE SAFETY TRIP**—pilot-operated, leverless.
4. **PARTIAL LOAD ECONOMY**—by individual nozzle control.
5. **DYNAMOMETER TESTED**—before shipment.

During 1940, 87% of orders for Coppus Steam Turbines were repeat orders. Bulletin 135-9 describes vertical and horizontal types; also with built-in speed reducer. Steam, air or gas-operated. Write for this bulletin today.

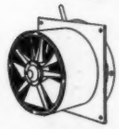
**H. P. not E. P.* for small H. P. jobs.**

*Elephant Power—a large-size turbine for a job a small-size Coppus could handle. Save investment cost with a Coppus Turbine sized close to your needs.

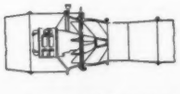
**COPPUS ENGINEERING CORP., 427 Park Ave., Worcester, Mass. Sales offices in THOMAS' REGISTER. See REFINERY CATALOG for other "Blue Ribbon" products—air filters, gas burners, blowers, ventilators, fans.**

## COPPUS BLUE RIBBON PRODUCTS

*Designed for your Industry*
*Engineered for You*

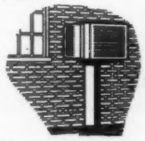


**COPPUS-DENNIS FANNIX GAS BURNER.** New method of mixing gas and air insures perfect gas-air ratio—instant, complete combustion. Bulletin 410-2.



**COPPUS VANO BLOWERS.** 1001 uses. High efficiency on special installations where ordinary fans fail. Bulletin 115-6.

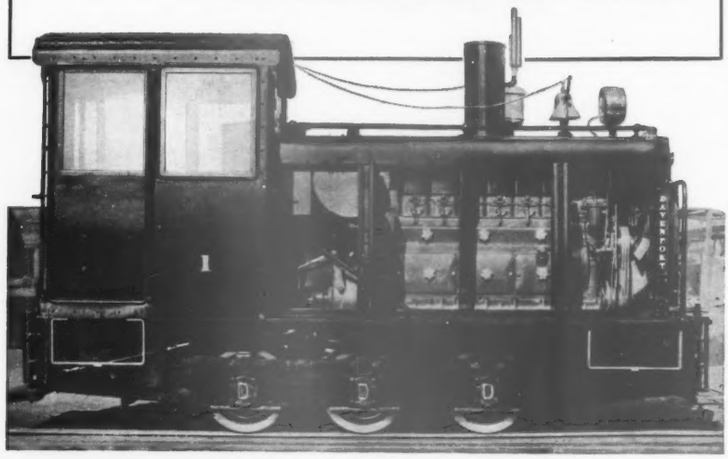
**COPPUS CABLE MANHOLE AND TANK VENTILATORS.** For any confined working space. Special adaptions for boilers, tank cars, shipholds. Bulletin 163-1



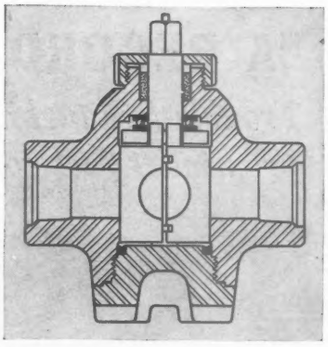
**COPPUS AIR FILTERS.** For engines and air compressors. Perfect, uninterrupted filtration. Bulletin F-310-4.

# COPPUS

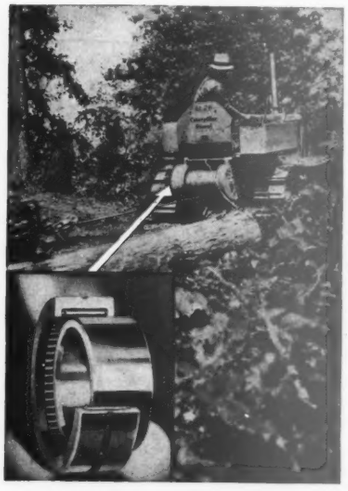
# In the News
## WITH BANTAM BEARINGS



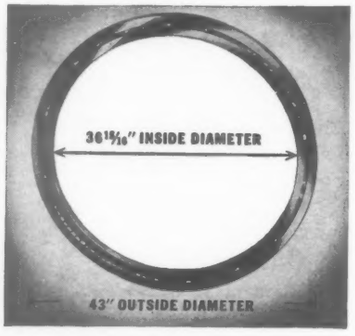
**UP-TO-THE-MINUTE LOCOMOTIVE** of the industrial type is this unit designed and built by Davenport Besler Corp. for hauling sugar-cane in Puerto Rico. Locomotive replaces steam unit previously used, is powered by 6-cylinder Fairbanks-Morse Diesel engine. Bantam Quill Bearings, used on the wrist pins of the Diesel, are the recognized standard for this service, where their small size and high capacity in oscillating loads are outstanding advantages.



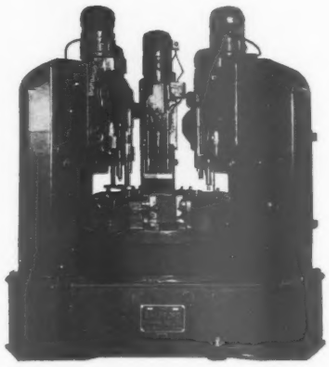
**PLUG VALVES** made by Mission Manufacturing Co. are the product of painstaking research, are subjected to rigid inspection and test. In keeping with its standards of quality, Mission selects Bantam Ball Thrust Bearings for use on its plug valves. Bantam Bearings are serving the oil industry efficiently in pumpers, rotaries, swivels, and many other applications.



**LOGGING OPERATIONS** in rough, hilly country put towing equipment to the severest test. Willamette Hyster Co. improves efficiency, lengthens service life of its HYSTER D2 Towing Winches by using Bantam Quill Bearings on idler gear and reverse idler gear—where space is so limited that no other type of anti-friction bearing could be successfully employed. Moreover, the Quill Bearing is low in cost and easy to install. For further information on this compact, high-capacity bearing, write for Bulletin J-104




**THIS GIANT ROLLER BEARING** has a radial capacity of 225,000 pounds at 100 RPM, uses 125 rollers 1" long and 1" in diameter. It is one of a group specially engineered by Bantam for use by Ohio Oil Company in central station pumping equipment, to provide high radial capacity and reduce need of servicing.



**6-STATION DRILLING MACHINE** built by The Bradford Machine Tool Company turns on Bantam indexing table bearing of the ball thrust type, measuring 30" O.D., 27" I.D., 2" thick. Here is another typical instance of the way Bantam serves industry with custom-built bearings in large sizes or special types. If you have an unusual bearing problem, TURN TO BANTAM.

**BANTAM BEARINGS**

**STRAIGHT ROLLER · TAPERED ROLLER · NEEDLE · BALL**

**BANTAM BEARINGS CORPORATION • SOUTH BEND • INDIANA**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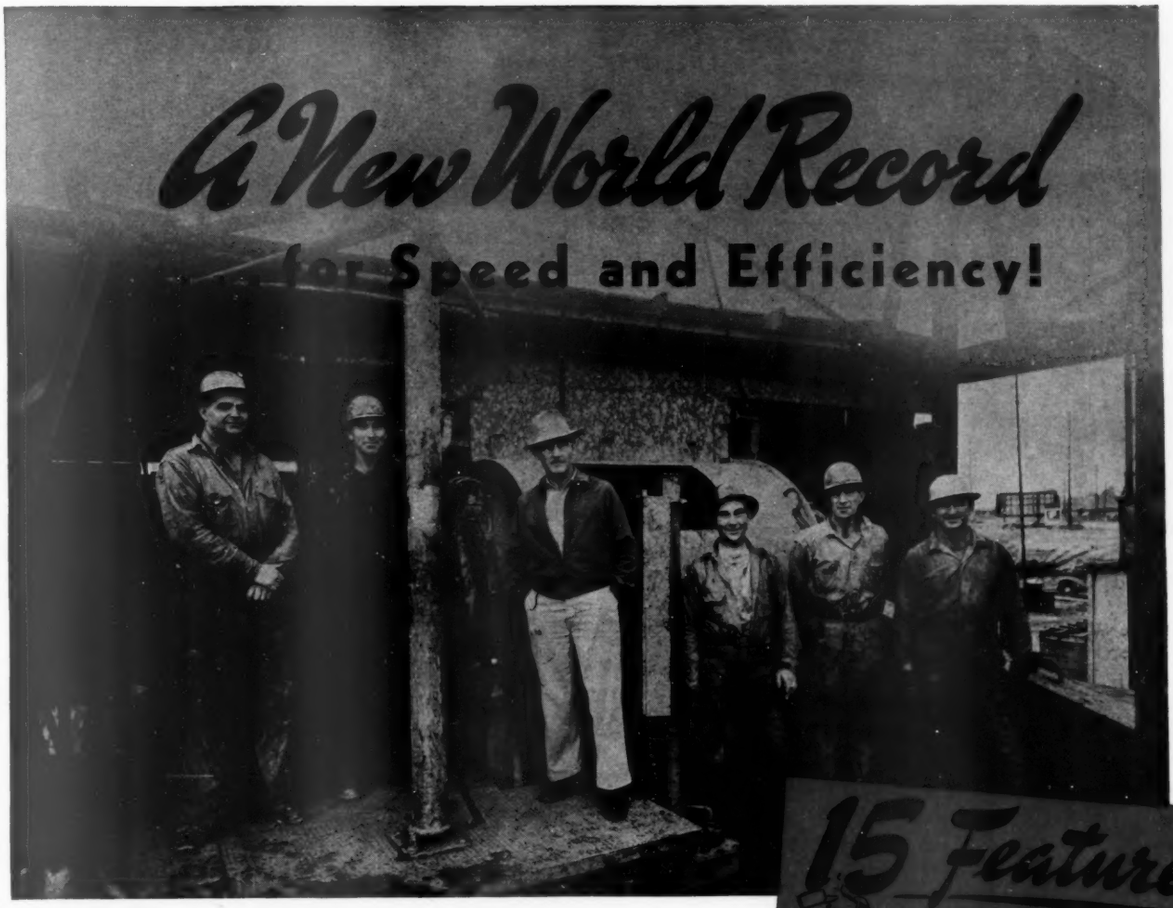
# A New World Record for Speed and Efficiency!



## Wilson Rig Drills 1595 Feet in 8 Hours During Record Run ! ! !

What is believed to be a world record for drilling and completion at 2713 ft. was achieved by the Kern Drilling Co. with a Wilson Titan Model Power Rig on Harbor No. 2 location in California for the Sound Petroleum Corp. during the month of December.

The entire job from spud-in until casing landed consumed but 40 hours. A total of 25 hours elapsed from spud-in until drilling was completed. An electric log, well survey, and conditioning and casing run took but 14 hours.

During one eight-hour run when a total of 1595 ft. was completed, the Wilson Power Rig maintained a drilling speed of 199.3 ft. per hour—certainly a world's record for any similar number of hours! The Wilson Titan Model Power Rig used to drill this well was three years old and had seen service on many drilling jobs. Another Wilson Rig owned by the same company drilled to a depth of 10,747 ft. at the lowest drilling cost ever recorded in California to a comparable depth. This is one of the four Wilson models which have set seven outstanding speed and efficiency records the past several years!

● The Wilson Streamlined Titan Model of today has all 15 exclusive features mentioned at right—and more! Ask for new 1941 catalog, containing complete specifications!

## 15 Features EXCLUSIVE TO WILSON

1. Flame Hardened, Ground and Polished Alloy Steel Brake Rings—file hard!
2. Dynamically Balanced Drum and other Rotating parts.
3. Complete Instrument Panel with sliding door.
4. Cathead Safety Device to protect operator.
5. Cradle Mounted Hydromatic Brake with instant energizing clutch lever, controlled from driller's position.
6. Clamp-On-Cover Oil Tite Chain Guards. On or off in a minute!
7. Rubber Cushion Mounted Shock Absorbing Chain Transmission.
8. Air Controlled Transmission with "speed lock" prevents shifting at speeds that would damage transmission.
9. Full Circulating Water Cooled Friction Clutches (a drum) same system cooling both brakes and clutches.
10. Internal Expanding (Patented) Shoe Type Clutch.
11. Safety Locking Belts lock clutch spider to drum, and jaw clutch on counter shaft, insure positive drive.
12. Friction Lock on Brake Lever; perfect feeding without automatic feed control unit.
13. Rubber Cushion Shock Absorbing Engine Clutches.
14. Automatic Friction Clutch Air Pressure Control System.
15. High and Low Speed Friction Drum Clutches with Proper Rig Air Controls and Manual Emergency Control.

*Wilson Sets the Pace!*

**Wilson MANUFACTURING COMPANY, INC.**
WICHITA FALLS, TEXAS

EXPORT REPRESENTATIVE
Guy E. Daniels
30 Rockefeller Plaza, New York City

PACIFIC COAST DISTRIBUTOR
H. & B. Sales Co., Ltd.
Long Beach, California

FIG. 1501 *(RIGHT)*
CAST STEEL GATE VALVE

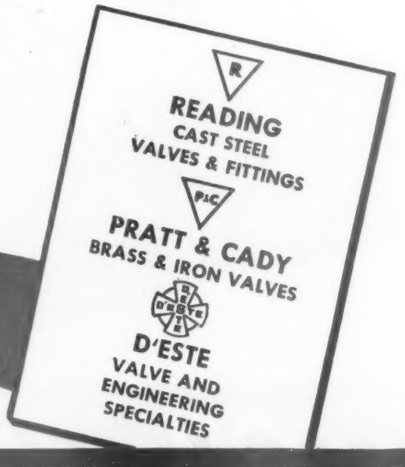
FIG. 1511 *(BOTTOM)*
CAST STEEL GLOBE VALVE

FIG. 1515 *(LEFT)*
CAST STEEL ANGLE VALVE

FIG. 1531 *(TOP)*
CAST STEEL CHECK VALVE

# READING-PRATT & CADY Helps You Standardize on 150 lb. Steel Valves

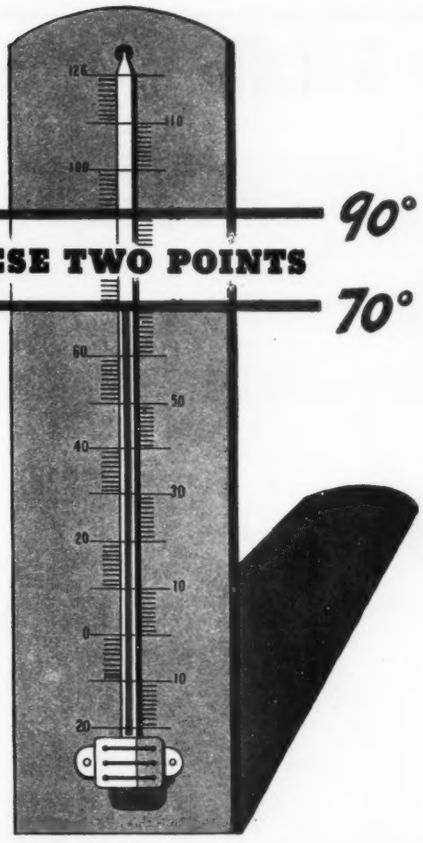
**The valves and fittings pictured above are typical examples of Reading-Pratt & Cady's extensive line of gate valves, check valves, globe and angle valves—Cast Steel Fittings for 150 lb. Service in the Oil Country. . . . Their use is indicated wherever you handle inflammable and hazardous liquids—wherever there may be surges of pressure, vibration or bending stresses not successfully withstood by iron body valves—for shut off service on tank farms—for fire fighting systems, etc. . . . Use them also for low pressure, high temperature steam—to handle exhaust steam and for auxiliary services such as injector pumps, soot blowers, condensers, heat interchangers. . . . Side wall thicknesses are greater than A.P.I. specifications and therefore promise longer resistance to corrosion and erosion. Write for the details.**




**READING-PRATT & CADY**
READING, PENNSYLVANIA

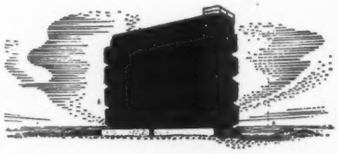
*A Division of* AMERICAN CHAIN & CABLE COMPANY, INC.

# A ZIG- AND A ZAG IS THE SHORTEST DISTANCE BETWEEN THESE TWO POINTS

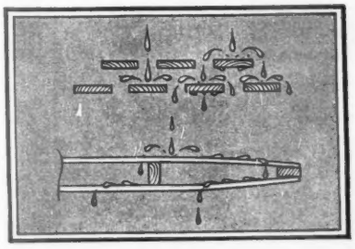



What keeps a Fluor Cooling Tower at everlasting efficiency during years of continued service? You'll find the answer in design, construction, materials and craftsmanship.

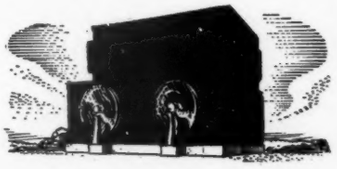
Let's concentrate on design for a moment. Major design problem regardless of type of tower is to obtain fastest dissipation of heat, with space economy, water economy and power economy. Patented Fluor cooling deck design conclusively proves that a zig and a zag is the shortest distance between two points on any thermometer.



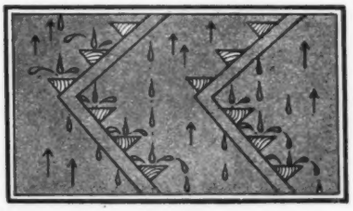
In the Atmospheric *Aerator Type* Cooling Tower, double staggered, bowed panel decks swiftly cool the water from the tower's top to bottom; patented exterior aerators keep water distribution undisturbed—keep water losses due to wind to the minimum.



In the Forced and Induced Draft Type Towers, triangular bar type cooling decks are arranged in reversing inclined rows, providing maximum intimacy of contact between the falling water and the counterflow air stream. And the new modified aerator outer shell covering is one of the most distinct advances in



mechanical draft cooling tower design, lengthening tower life and setting new standards of appearance for this class of tower. Request your copies of Bulletins T-337 and MDT-340 for description of both types of Fluor Cooling Towers.



*Another Reason To* fl *Be Sure with Fluor*

THE FLUOR CORPORATION LTD.
2500 So. Atlantic Blvd., Los Angeles, Calif.
KANSAS CITY • HOUSTON • CHICAGO
PITTSBURGH • NEW YORK

**FLUOR COOLING TOWERS**

# *AXELSON* SUCKER RODS ARE GOOD BECAUSE THEY USE THE BEST STEEL . . . .

Axelson sucker rods are good because they are made of the best steel available. TIMKEN Alloy Steels are used exclusively in the manufacture of Axelson No. 59 and 69 sucker rods.

For nearly half a century this company has been a leader in the manufacture of oil-field equipment. They long ago learned that superior steel is essential in the making of a superior product.

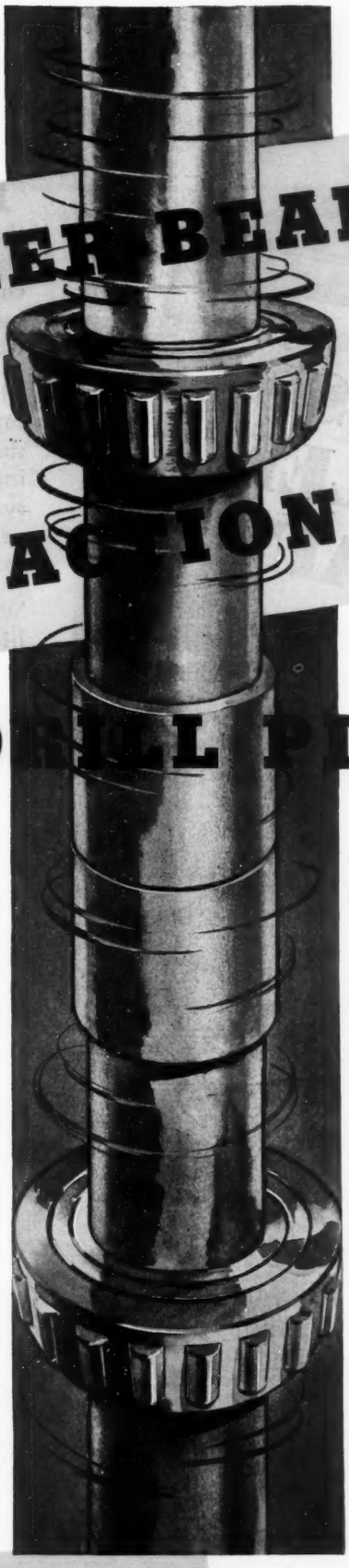
Follow the leaders and you'll buy TIMKEN Alloy Steels. Consult us today without obligation.

**THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO**
**Steel and Tube Division**

**TIMKEN**
***ALLOY STEELS***

Manufacturers of TIMKEN Tapered Roller Bearings for automobiles, motor trucks, railroad cars and locomotives and all kinds of industrial machinery; TIMKEN Alloy Steels and Carbon and Alloy Seamless Tubing; and TIMKEN Rock Bits.

# Give ROLLER BEARING ACTION TO YOUR DRILL PIPE!



## AQUAGEL REDUCES FRICTION

A straight AQUAGEL and water mud, or a native mud to which an adequate amount of AQUAGEL has been added, covers all moving parts of the drilling equipment in contact with the mud, with a lubricating gel. The entire surface of the drill pipe, for example, is completely lubricated. This gives a "roller-bearing" action to the drill pipe which reduces friction, thus less power is needed and the danger of stuck pipe is minimized.

AQUAGEL in drilling mud also surrounds all sand and grit with a protective lubricating gel which helps to prevent corrosion by covering all exposed metal parts with an inert colloidal film. The cost of the AQUAGEL used is often repaid by the savings in pump part replacements alone.

AQUAGEL is also extremely economical because it will yield 100 or more barrels of good drilling mud per ton of clay.

PATENT LICENSES, unrestricted as to sources of supply of materials but on royalty bases, will be granted to responsible oil companies and operators to practice the inventions of any and / or all of United States Patents Nos. 1,575,944; 1,575,945; 1,807,082 and 1,991,637 and further improvements thereof. Applications for such licenses should be made to the Los Angeles office.

### BAROID PRODUCTS

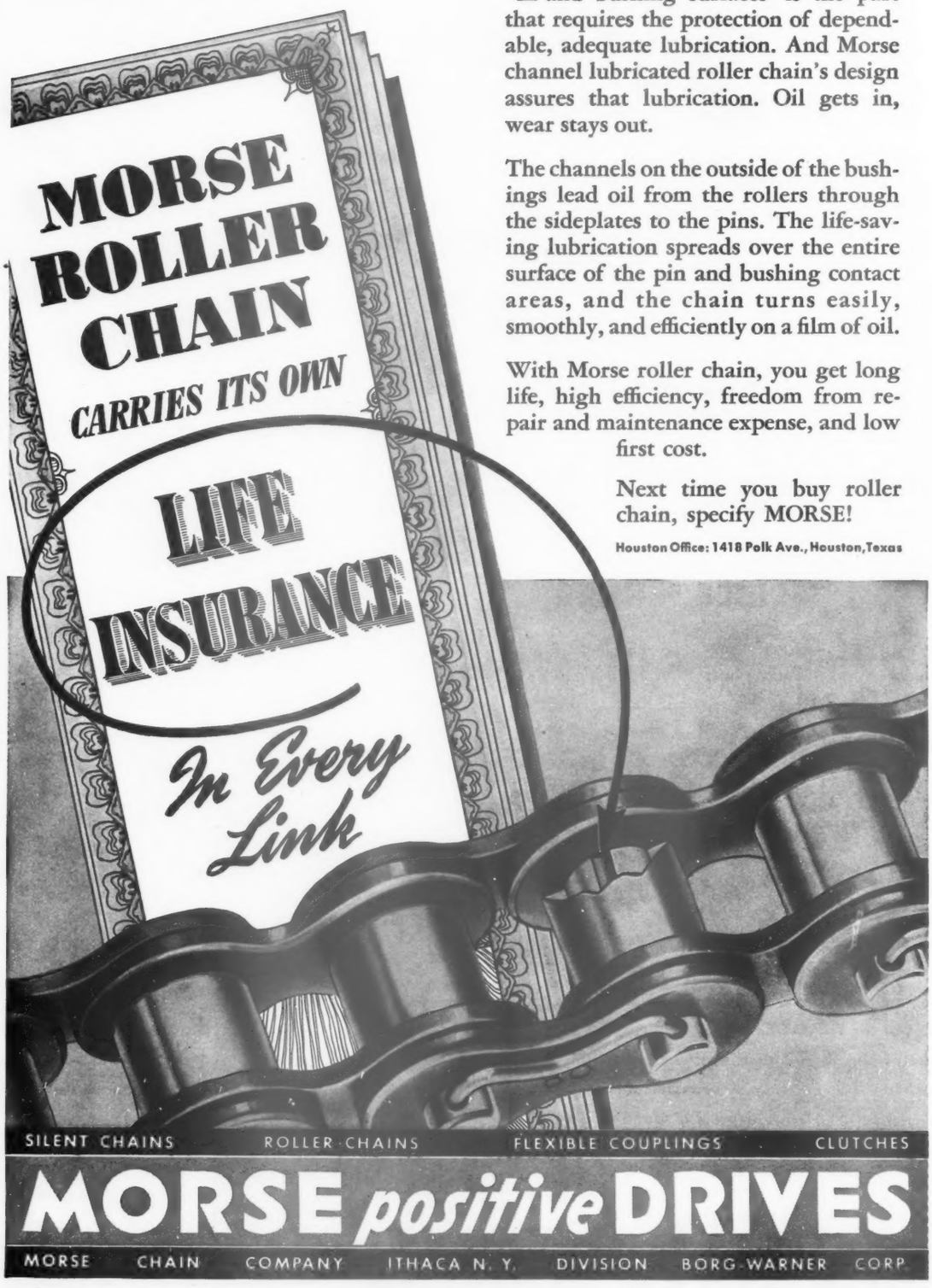
BAROID and COLOX—Drilling Mud Weighting Materials.
AQUAGEL—Gel-Forming Colloidal Drilling Clay.
FIBROTEX—For Regaining or Preventing the Loss of Circulation.
BAROCO—A Salt-Water-Resisting Drilling Clay.
STABILITE—A Chemical Mud Thinner.
AQUAGEL-CEMENT—For Recovering Lost Circulation and Cementing Casing.
SMENTOX—For Counteracting the Effects of Cement Contamination and for Reconditioning Cement-Cut Mud.
ZEOGEL—Used as a Suspending Agent When High Concentrations of Salt or Salt Water Are Encountered.
IMPERMEX — A Concentrated Colloidal Additive Agent for Reducing Water Loss in Salt-Laden Muds.
MICATEX—For Reducing Water Loss to the Formation and for Overcoming Mild Cases of Lost Circulation.
TESTING EQUIPMENT—For Drilling Mud Analysis and Control.
BAROID WELL LOGGING SERVICE—Formation Information Thru Mud Analysis

**BAROID SALES DIVISION**
*National Lead Company*

Baroid Products and Service Engineers are available in all active oil fields in the U.S.A.

TRADEMARK BAROID OIL WELL DRILLING MUD SERVICE

**BAROID SALES OFFICES: LOS ANGELES • TULSA • HOUSTON**




THE HEART of a roller chain—the pin and bushing surfaces—is the part that requires the protection of dependable, adequate lubrication. And Morse channel lubricated roller chain's design assures that lubrication. Oil gets in, wear stays out.

The channels on the outside of the bushings lead oil from the rollers through the sideplates to the pins. The life-saving lubrication spreads over the entire surface of the pin and bushing contact areas, and the chain turns easily, smoothly, and efficiently on a film of oil.

With Morse roller chain, you get long life, high efficiency, freedom from repair and maintenance expense, and low first cost.

Next time you buy roller chain, specify MORSE!

Houston Office: 1418 Polk Ave., Houston, Texas

SILENT CHAINS ROLLER CHAINS FLEXIBLE COUPLINGS CLUTCHES

MORSE *positive* DRIVES

MORSE CHAIN COMPANY ITHACA N. Y. DIVISION BORG-WARNER CORP.

Just one of the various steps taken to assure the "second to none reputation" for quality and safety enjoyed by this company among refiners over a number of years.

All Kellogg fabricated pressure vessels and heat transfer equipment can be depended upon to fulfill the most exacting refining conditions.

Consult this company when in need of special equipment to meet the present day demands of the petroleum industry.

## Extra-long seamless tubes with no "middle weld" . . .

## another advantage of National's *"Complete Tube Service"*

HERE'S another example of the way National's "Complete Tube Service" operates. This service makes available to you not only the widest selection of steel analyses, sizes, and wall thicknesses, but also the longest continuous seamless still tubes—up to 52 feet.

These extra-long tubes solve an important problem in modern refinery operations. They meet the demand for longer tubes due to changes in furnace design and improved methods of refining. As with regular length tubes, they are made to meet all requirements of current specifications. Available in different steels and various wall thicknesses—plus the added advantage of no middle weld.

Why not let one of our refinery tube experts tell you more about National's "Complete Tube Service." It won't cost you a cent, but it may save you thousands of dollars.

. . .

**A 300,000-POUND** cold-drawing tube bench, the largest in the world, is used in the finishing of NATIONAL Seamless Refinery Tubes.

### 21 ANALYSES TO CHOOSE FROM

Here is the widest available assortment of steel analyses for still tubes, condenser tubes, heat-exchanger tubes, and refinery piping.

| | |
|---|---|
| LOW CARBON | 3 CR., 1 MOLY. |
| LOW CARBON, ½ MOLY. | 5 CR., ½ MOLY. |
| 1¼ SIL., ½ MOLY. | 5 CR., ½ MOLY., 1½ SIL. |
| LOW CARBON, 1 MOLY. | 5 CR., ½ MOLY., TITANIUM |
| 1¼ CR., ½ MOLY. | 5 CR., ½ MOLY., COLUMBIUM |
| 1¾ CR., ¾ MOLY. (Bain Alloy) | 8 CR., 1 MOLY. |
| 2 CR., ½ MOLY. | 18-8 |
| 2 CR., ½ MOLY., 1¼ SIL. | 18-8, TITANIUM |
| 2½ CR., ½ MOLY., ¾ SIL. | 18-8, COLUMBIUM |
| 2¾ CR., 1 MOLY. | 25 CR., 20 NICKEL |
| 3 CR., ½ MOLY., 1¼ SIL. | |

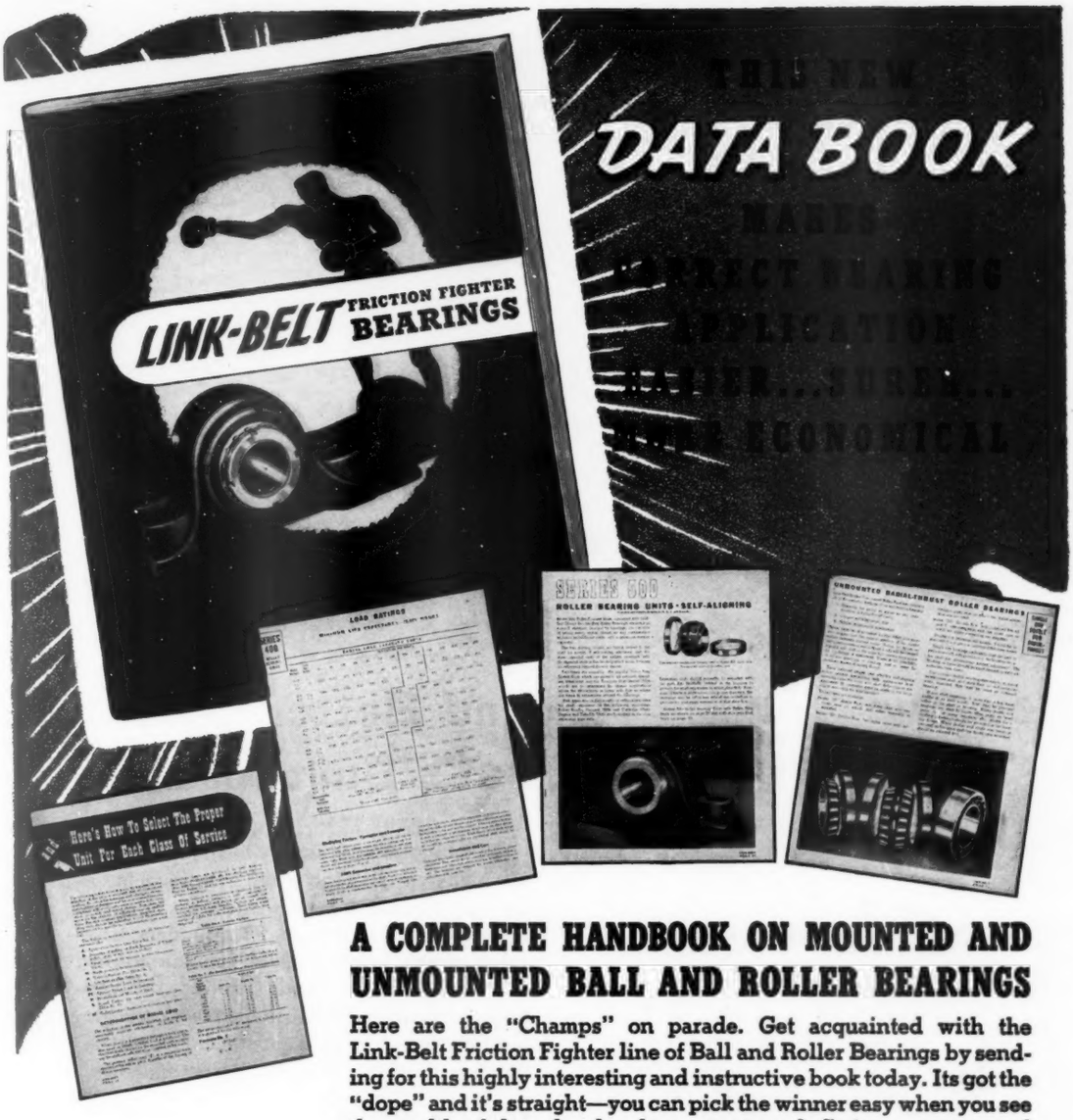
*For Still Tubes*
*Condenser Tubes*
*Heat Exchanger Tubes*
*Refinery Piping*

# NATIONAL TUBE COMPANY

PITTSBURGH, PA.

Columbia Steel Company, San Francisco, *Pacific Coast Distributors* · United States Steel Export Company, New York

UNITED STATES STEEL


LINK-BELT FRICTION FIGHTER BEARINGS
DATA BOOK
Here's How To Select The Proper Unit For Each Class Of Service
LOAD RATINGS
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ROLLER BEARING UNITS - SELF-ALIGNING
UNMOUNTED RADIAL-THRUST ROLLER BEARINGS

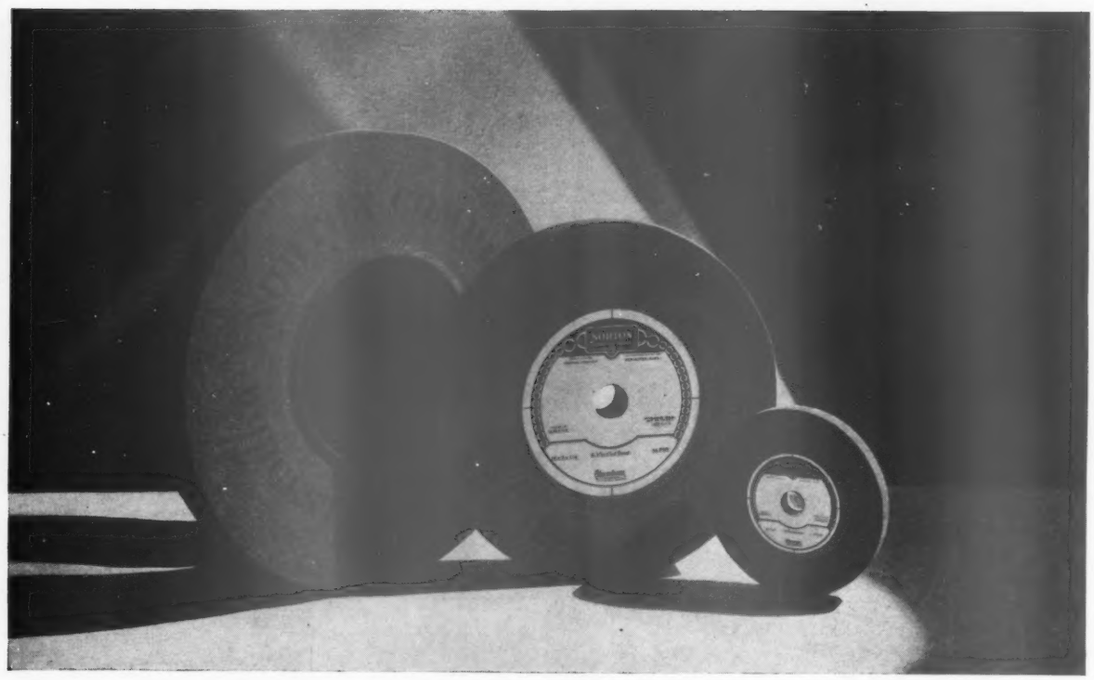
## A COMPLETE HANDBOOK ON MOUNTED AND UNMOUNTED BALL AND ROLLER BEARINGS

**Here are the "Champs" on parade. Get acquainted with the Link-Belt Friction Fighter line of Ball and Roller Bearings by sending for this highly interesting and instructive book today. Its got the "dope" and it's straight—you can pick the winner easy when you see the wealth of data that has been uncovered. Swing your pen and you will have it pronto—ask for Book OG-1775—write today!**

**LINK-BELT COMPANY**

Indianapolis Houston Dallas Los Angeles Kansas City, Mo. New York Toronto
Distributors in all fields 8394-D

**LINK-BELT** *Friction Fighter* **BEARINGS**



## You Can Grind Faster and Better With a Wheel That's Built for the Job

AND Norton can supply the right wheel for any grinding job in the petroleum industry—production or maintenance. Six abrasives (Alundum, 19 Alundum, 38 Alundum, Crystolon, green Crystolon and genuine crushed diamonds) and six bonds (vitrified, B-E vitrified, resinoid, rubber, shellac and silicate) make it possible to meet the individual requirements of any grinding operation.

Near you there's a Norton distributor with a wide assortment of grinding wheels in stock and ready to give you the benefit of his experience in selecting the ones you need. Write for his name.

NORTON COMPANY, WORCESTER, MASS.

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NORTON ABRASIVES

# *Wherever There's An Oil Field*

# *Century* MOTORS and GENERATORS

## *are Cutting Production Costs!*

### Century Type SCT Motors

Century Type SCT Splashproof Motors, with high torque and high slip, are on the job day after day in both foreign and domestic fields, working steadily in all climates under all conditions, delivering dependable, low cost service.

Because Century Type SCT Splashproof Pumping Unit Motors are designed to reduce the shock on equipment, to cushion the impacts, you are assured of less wear and tear on pumping units and lower maintenance expense.

These motors are engineered with an unusually high starting torque with which to start the toughest loads; they have a high slip, which means that the motor speed pulls down when the load comes on. As a result, jolts and jars are reduced materially, equipment gains a longer working life.

Splashproof construction provides protection against climatic conditions—snow, rain and ice—assuring continuous performance in all weathers.

In oil fields throughout the world, Century SCT Motors are saving money for their operators. For all the facts, see your regular supply store or call in your nearest Century Motor Specialist.

Century Splashproof Motor Driving an Oil Field Pumping Unit

Century ACGR Generator — Engine Driven

### Century Type ACGR Generators

Where public service current is not available, an engine generator set with a Century Type ACGR Close Regulating Generator has proven to be a most dependable source of low cost power. It maintains the voltage for squirrel cage motors within permissible limits without the use of any accessory devices. Rheostats, meters, regulators or control panels are unnecessary.

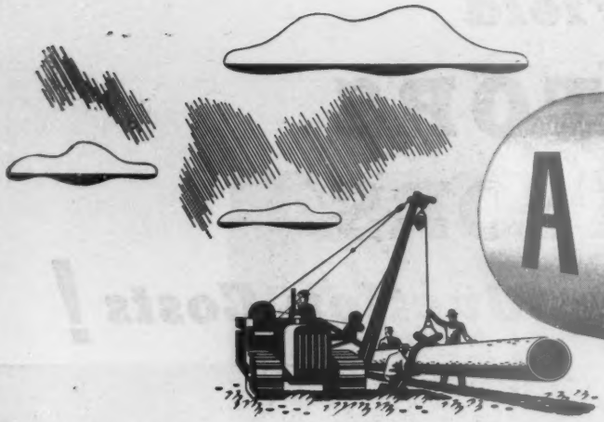
For complete information on how Century Type ACGR Generators can keep your pumping costs down and assure continuous production, see your regular supply store or call in your nearest Century Motor Specialist.

**CENTURY ELECTRIC COMPANY**

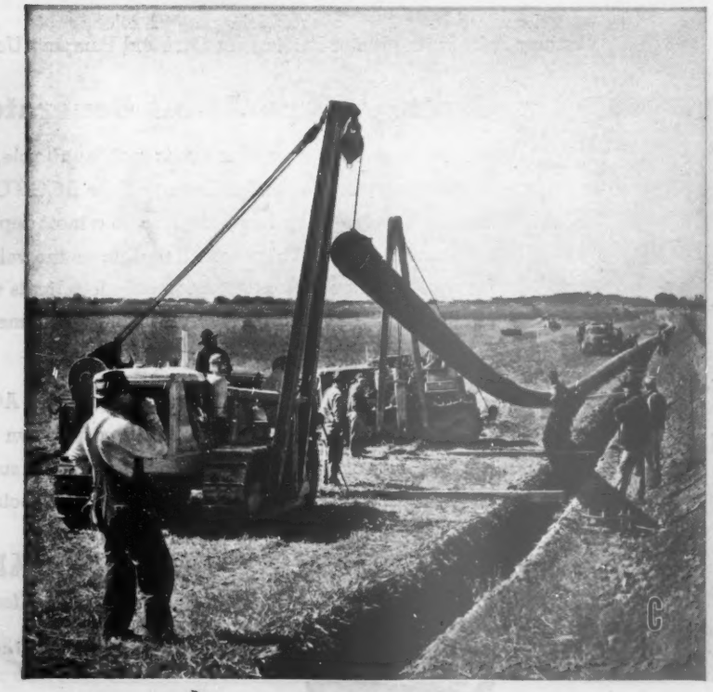
1806 Pine Street — St. Louis, Missouri

*Offices and Stock Points in Principal Cities*

*One of the Largest Exclusive Motor and Generator Manufacturers in the World*



# A MILE A DAY OF 2



"All our 'Caterpillar' track-type Tractors are doing a job for us—and our 'Caterpillar' Diesel D7s are the fastest stepping, hardest working pipe-line machines we've ever seen. The fast reverse speed steps up the whole job and the snap of the engine in taking up a load is another time-saving item. The fuel-economy is a real item, too, but that wouldn't mean a thing if performance didn't go with it. These D7s perform!"

# 20" O.D. ....with "Caterpillar" Diesels!

WHEN you've got "Caterpillar" Diesel Tractors handling *every phase* of a pipe-laying job — from clearing to clean-up — there's not much chance of a bottle-neck anywhere along the line slowing down your progress!

Because these machines are built to handle pipe efficiently . . . and *dependably*. Built to stand up and go under heavy loads, 24 hours a day if necessary, through rain or shine. And backing them up, there's always "Caterpillar" service "right around the corner"!

Those are some of the reasons "Caterpillar" Diesel Tractors get the big pipe-line jobs. Take this one right here, for instance: a hundred miles of 20-inch O.D. being laid from Geneseo to Belvidere, Illinois, by Dempsey-Wilson for the Natural Gas Pipe Line Company of America. A dozen "Caterpillar" track-type Tractors are on the job — *all over the job:* from the stringing crew to the fence crew. Clearing the right-of-way . . . cold-bending . . . stringing . . . doping . . . wrapping; it's *all* being done by "Caterpillar." And in spite of the size and weight of the pipe, the line moves along a mile a day!

You've got what you need, when you've got "Caterpillar" Diesel: power for heavy handling, stamina for steady handling!

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

**A CLEARING.** A handy, fast, economical worker clearing off grade and berm—making level, easy going for the ditcher. This is the Dempsey-Wilson Company's "Caterpillar" Diesel D4 Tractor equipped with a Traxcavator. It uses less than one gallon of low-priced fuel an hour!

**B STABBING AND JOINING.** The 20" O. D. pipe goes into place with a "Caterpillar" Diesel D4 Tractor equipped with a Trackson side-boom. Quick response to clutch and lever and easy maneuverability count here!

**C COLD BENDS.** Watch that 20" O. D. take the shape Dempsey-Wilson want it to have. Real power needed for cold-bending pipe this size. But a "Caterpillar" Diesel D7 Tractor raises the end, while another holds the pipe down, and the job is done! These are the D7s that Mr. Wilson (of Dempsey-Wilson) says are the fastest stepping, hardest working pipe-line machines he's ever seen.

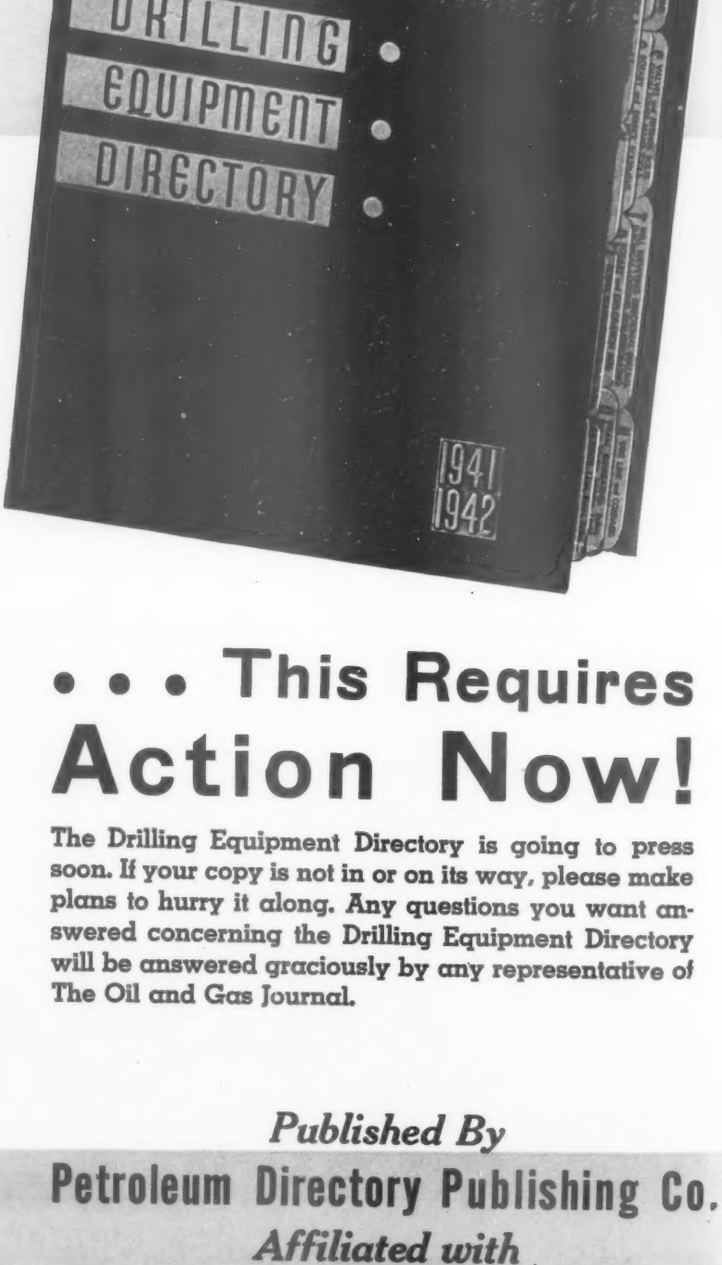
**D BRINGING UP THE DOPE POT.** There's lots of work on the line for this R2 — one of the smaller size "Caterpillar" track-type Tractors. Dempsey-Wilson have two and use them as roustabouts. When they aren't keeping the dope pots stepping, you'll see these two small tractors spotting equipment and jumping in on all the odd jobs that have to be done to maintain the fast schedule of a mile of this 20" O. D. pipe a day.

**E DOPING AND WRAPPING.** Another of those "Caterpillar" Diesel D7s. Equipped with a Trackson side-boom, it cradles the 20" O. D. for the doping and wrapping machine.

***• Pipe-line equipment is now available for five models of "Caterpillar" track-type Tractors: the R4, D4, R6, D6 and D8.***

**CATERPILLAR** REG. U.S. PAT. OFF. *DIESEL* **ENGINES AND ELECTRIC SETS • TRACK-TYPE TRACTORS • ROAD MACHINERY**

# HOW TO SELL MORE DRILLING EQUIPMENT IN 1941-42




## *Covers an $88,000,000 Market*

You may think you are reaching ALL of your possible prospects and customers, but are you? The Drilling Equipment market is a gigantic one. In fact, it has been worth over $88,000,000 annually to manufacturers and service organizations the past several years. This year it is expected to be greater. The Drilling Equipment Directory—the most direct method of covering this specific market—projects your sales messages before men who actually do the buying or influence the purchase of Drilling Equipment at the time they are most interested.

## *Favored In South America*

Complete distribution of the Drilling Equipment Directory is made to all men who have authority to buy or who influence the purchase of Drilling Equipment and Services. This list is up-to-date and as accurate as is possible to make it. Although it will be impossible to reach many warring European areas, South American markets will be covered thoroughly. This is considered the brightest spot for the next several years!

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You don't have to guess whether or not buyers read the Drilling Equipment Directory, because it's designed for constant use. Combined between the covers of this book is a Complete Handbook of Engineering Data; the latest A.P.I. Specifications; valuable Graphs and Charts; an Up-To-Date Buyer's Guide of Drilling Equipment and Services; and a Tabbed System which makes it easy and convenient to use the book. BY PLACING YOUR ADVERTISING IN THE DIRECTORY YOU ARE ASSURED OF SELLING MORE DRILLING EQUIPMENT IN 1941 and 42!

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## • • • This Requires Action Now!

The Drilling Equipment Directory is going to press soon. If your copy is not in or on its way, please make plans to hurry it along. Any questions you want answered concerning the Drilling Equipment Directory will be answered graciously by any representative of The Oil and Gas Journal.

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# USE HORTONSPHEROIDS
## for pressure storage . . .

## AT MODERN MARKETING TERMINALS

THERE are good reasons for the increasing use of Hortonspheroids for storage of motor gasoline. Marketing organizations have found that storing of high test fuels in tanks which will stand a pressure of several pounds per square inch stops all loss of vapor by breathing and prevents lowering of volatility. They have also found that they can get this kind of protection in large units of capacity and at reasonable cost with Hortonspheroids.

At the right is a view of the harbor at So. Portland, Maine, showing several marketing terminals. There are three spheroids, one of 6,000-bbl. and two of 50,000-bbl. capacity for 2½ lbs. pressure at the plant in the foreground (a close-up of these units is shown above)—and one 80,000-bbl. unit at the terminal at the right. Other sizes for handling motor fuel are available in capacities up to 100,000-bbl. or more, for pressures up to 20 lbs. per sq. in. Our nearest office will be glad to give you complete information.

# CHICAGO BRIDGE & IRON COMPANY

**Fabricating Plants in BIRMINGHAM, CHICAGO and GREENVILLE, PA.**

| | | | | | |
|---|---|---|---|---|---|
| DALLAS | 1641 Praetorian Bldg. | CHICAGO | 2128 McCormick Building | PHILADELPHIA | 1615-1700 Walnut St. Building |
| HOUSTON | 918 Richmond Avenue | DETROIT | 1514 Lafayette Building | BOSTON | 1517 Consolidated Gas Building |
| TULSA | 1606 Hunt Building | CLEVELAND | 2204 Builder's Exchange Bldg. | SAN FRANCISCO | 1054 Rialto Building |
| BIRMINGHAM | 1536 N. Fiftieth Street | NEW YORK | 9347-165 Broadway Building | LOS ANGELES | 1423 Wm. Fox Building |

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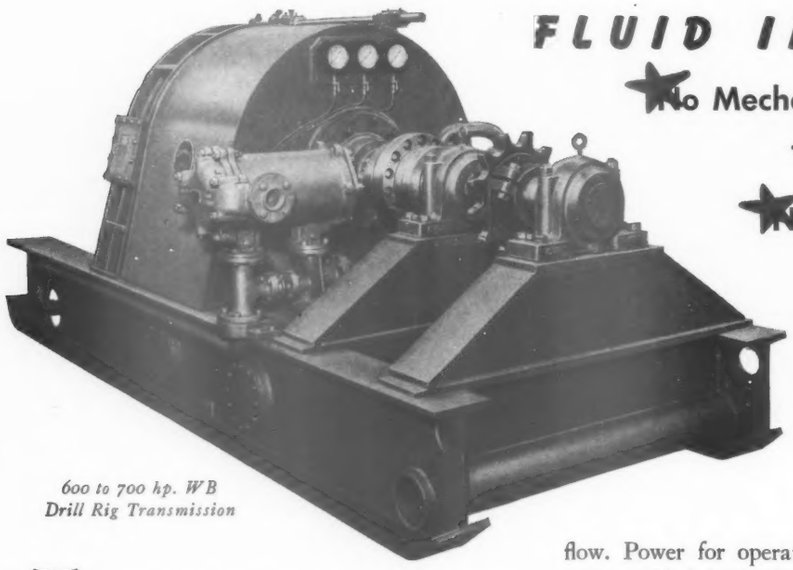
# WORTHINGTON HYDRAULIC TRANSMISSION



*600 to 700 hp. WB Drill Rig Transmission*

## FLUID IMPULSE

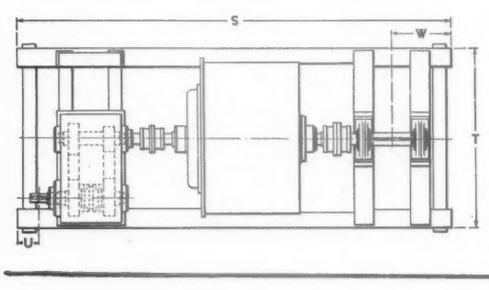
- No Mechanical Connection
- No Shocks
- No Vibration
- Saves Time
- Reduces Wear
- Cuts Costs

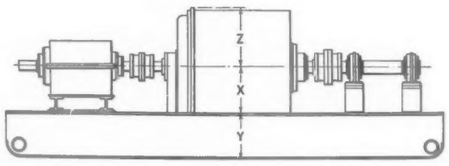
THE NEW Worthington Drill Rig Drive for use with internal combustion engines combines a variable torque hydraulic transmission and reverse gear in one compact unit—far more flexible and easier to handle than either steam or electric drive.

Forward and reverse motion, as well as idling, is accomplished without gears or clutches of any kind and depends only upon the hydraulic reaction developed within the transmission by hydraulic flow. Power for operating the draw works and rotary table is under instant control of the driller.

Smoothness and efficiency of operation are the outstanding characteristics of the Worthington Drive. There is absolutely no transmission of shocks—no impact, backlash or vibration. This is proved by operating reports from the field. Wear and maintenance on the rig are greatly reduced. Drilling time is shortened and costs are lowered.

Investigate this new Worthington development. Write for detailed information and prices.




| TYPE | H. P. | S | T | U | W | X | Y | Z |
|---|---|---|---|---|---|---|---|---|
| WB-34 | 400/500 | 15½′ | 76″ | 11″ | 24″ | 18″ | 18″ | 22″ |
| WB-40 | 600/700 | 16½′ | 80″ | 11″ | 26″ | 20″ | 21″ | 25″ |

# AND REVERSING GEAR
## The Perfect Draw Works Drive

### DRILLERS *like it!*

Holds the bit on bottom

Never stalls the engines, even with stuck pipe—simply slows down with increasing hole friction

Handles without effort

Snappy on reversals

Has speed when making trips and when drilling

Has high cuthead speeds

Has wide speed variation when drilling

Requires no attention or lubrication

Kicks out the clutches like steam

Works equally well in hot or cold weather

### TOOL PUSHERS *like it!*

Stands rough handling

Nothing to wear out

No upkeep except change of oil at long intervals

Prolongs life of engines, drill pipe, lines, chains and clutches

Handles as a complete unit when rigging up and taking down

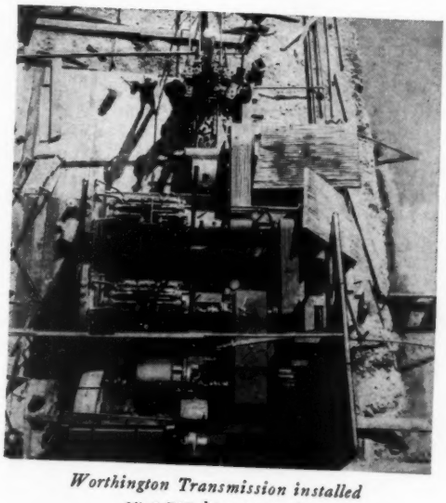
Engines may be compounded when drilling and pump and rotary run at best speed of each

### OWNERS *like it!*

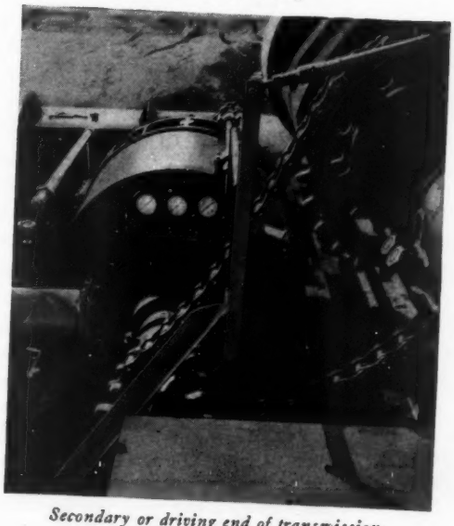
Prolongs life of the whole rig

Reduces operating and maintenance costs

Speeds up drilling



*Worthington Transmission installed on a 700 hp. power rig*

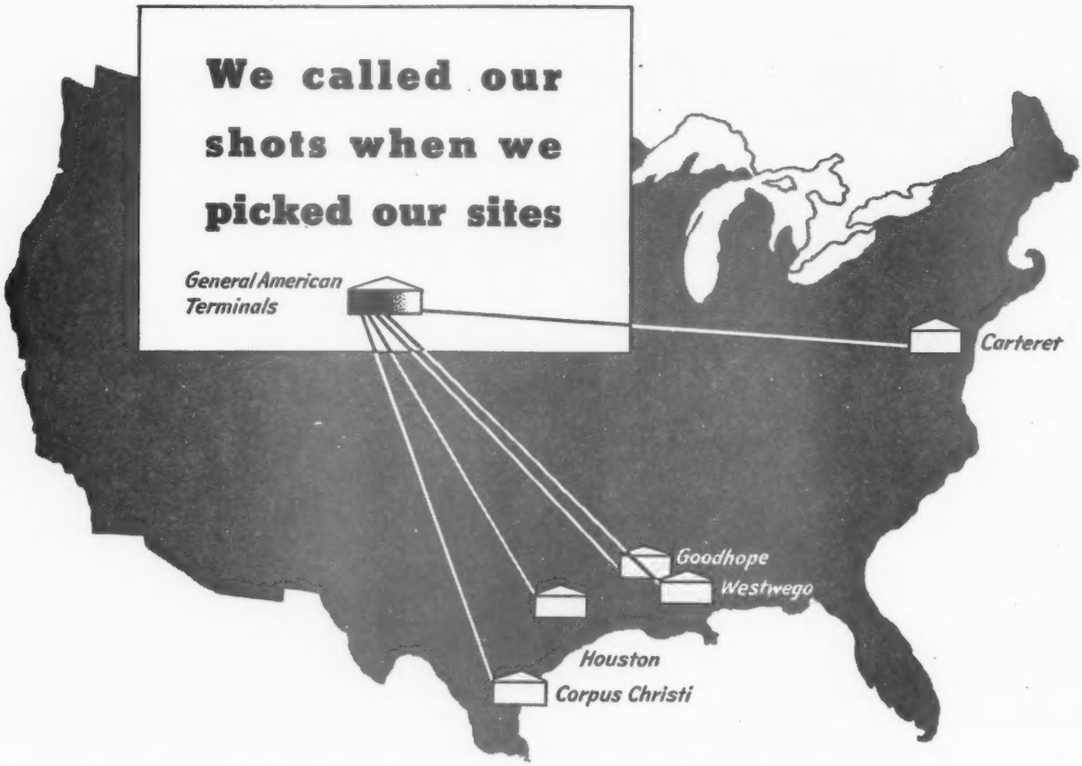


*Secondary or driving end of transmission with chain drive to draw works*

HT1-1

WORTHINGTON PUMP AND MACHINERY CORPORATION

Harrison, New Jersey




These five General American Terminals didn't just happen to be spotted where they are. Each location was chosen for special, strategic reasons. Each site embodies outstanding economies in freight rates and shipping facilities for every producer of bulk liquids. Each General American Tank Storage Terminal, of course, gives you seven exclusive advantages . . . advantages that are yours without a penny's investment on your part. See what you get and then see General American before you make another shipment!

***Only General American gives you all these advantages:***

1. *NO CONTAMINATION.* Separate pumps, lines, storage zones for dissimilar commodities.
2. *MODERN PROTECTION.* Latest safety appliances; lowest insurance rates, minimum evaporation losses.
3. *RELIABLE CUSTODIANSHIP.* Our warehouse receipts are highest type of collateral everywhere.
4. *INDEPENDENT OWNERSHIP.* Strictest privacy; we do not buy, sell or refine any commodities.
5. *NO WHARFAGE.* There is no wharfage charge at our own private docks.
6. *SPEED WITH SAFETY.* Day and night crews, complete facilities, eliminate all shipping delays.
7. *WORLD'S LARGEST TANK CAR FLEET.* One car or hundreds, wherever and whenever needed.

Strategically located to serve you!

GATX GENERAL AMERICAN

**GENERAL AMERICAN TANK STORAGE TERMINALS**

Goodhope, La., and Westwego, La., (Port of New Orleans) Corpus Christi, Texas
Carteret, N. J. (Port of New York) Galena Park, Texas (Port of Houston)

A DIVISION OF GENERAL AMERICAN TRANSPORTATION COMPANY

The Petroleum Industry today—like all American industry—is faced with its greatest challenge in history. It must carry out its share of a gigantic National Defense program and at the same time satisfy the normal needs of a prosperous nation. To do this requires steel products in unprecedented quantities.

Republic Steel, during the decade of its existence, has enlarged its facilities, improved its equipment and carefully trained its organization of men who know steel.

Today, Republic's men in the mills are proud of the new production records they are setting. In the offices, experienced men are doing their level best to see that the steel needs of the nation are served. Republic is doing its full part in supplying *steel—first line of national defense.*

R. J. Wysor
PRESIDENT

# REPUBLIC *electric weld casing*

"When setting your casing from 4500 to 4900 feet, we have the plug on bottom in an average of four hours and forty-five minutes." ● This statement from a Texas engineer,* after running 4912 feet of 5½-inch, Grade H-40, backs up every claim made for Republic Electric Weld Casing — its roundness, uniform wall thickness, full clean threads, sound welds and its normalized structure giving uniform strength.

*Descriptive literature giving recommended setting depths for the various grades will be sent on request.*

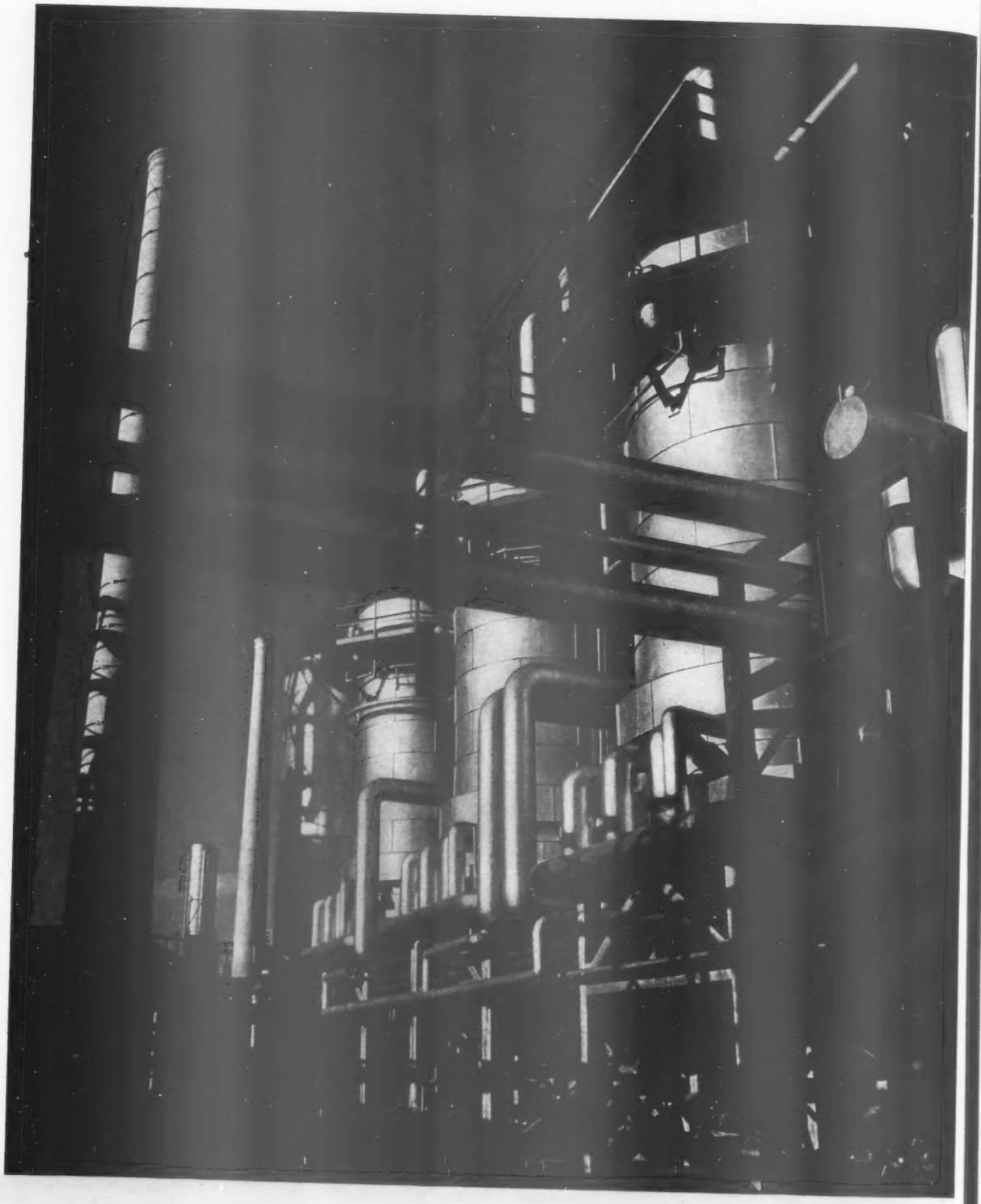
## REPUBLIC STEEL CORPORATION

Howard Supply Company, Los Angeles, California • General Offices: Cleveland, Ohio • Republic Supply Company, Houston, Texas

BERGER MANUFACTURING DIVISION • CULVERT DIVISION • NILES STEEL PRODUCTS DIVISION
STEEL AND TUBES DIVISION • UNION DRAWN STEEL DIVISION • TRUSCON STEEL COMPANY

*Name on request

**LINE PIPE—NORMALIZED CASING AND TUBING**



# HOUDRY CATALYTIC CRACKING PROCESS

# A CERTAINTY FOR THE FUTURE

- *Flexibility*—who knows what market requirements will be one, two, or three years from now?

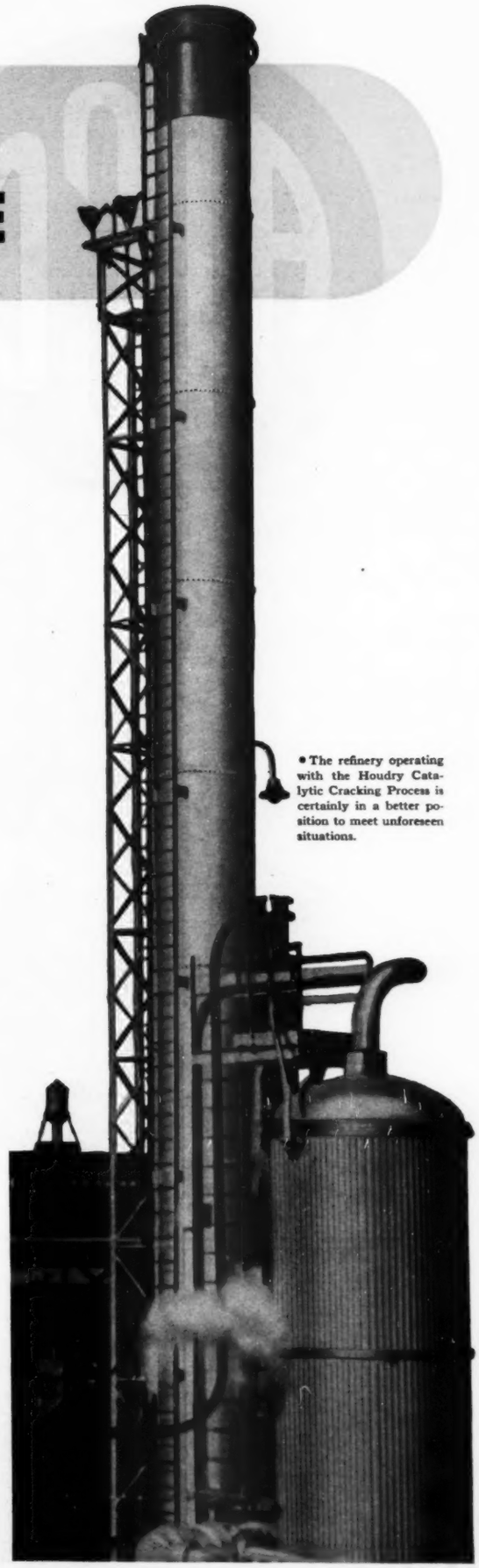
  The Houdry Process is the "perfect hedge" because it permits rapid change in character of output, greatly varying the yields of high octane motor and aviation gasoline and household or bunker fuel oil.

- *Adaptability*—who knows what charging stocks will be available?

  The Houdry Process is the "perfect hedge" because it will alternately crack (1) naphtha charge for either aviation or motor fuel production; (2) gas oil for either aviation or motor gasoline; (3) reduced crude for motor fuel.

- *Stability*—should a steady demand for a given product appear probable, can products be made and stored well ahead?

  The Houdry Process is the "perfect hedge" because its products show a remarkable stability in storage under widely different conditions.



• The refinery operating with the Houdry Catalytic Cracking Process is certainly in a better position to meet unforeseen situations.

*Licensing Agents for the Houdry Catalytic Cracking Process*

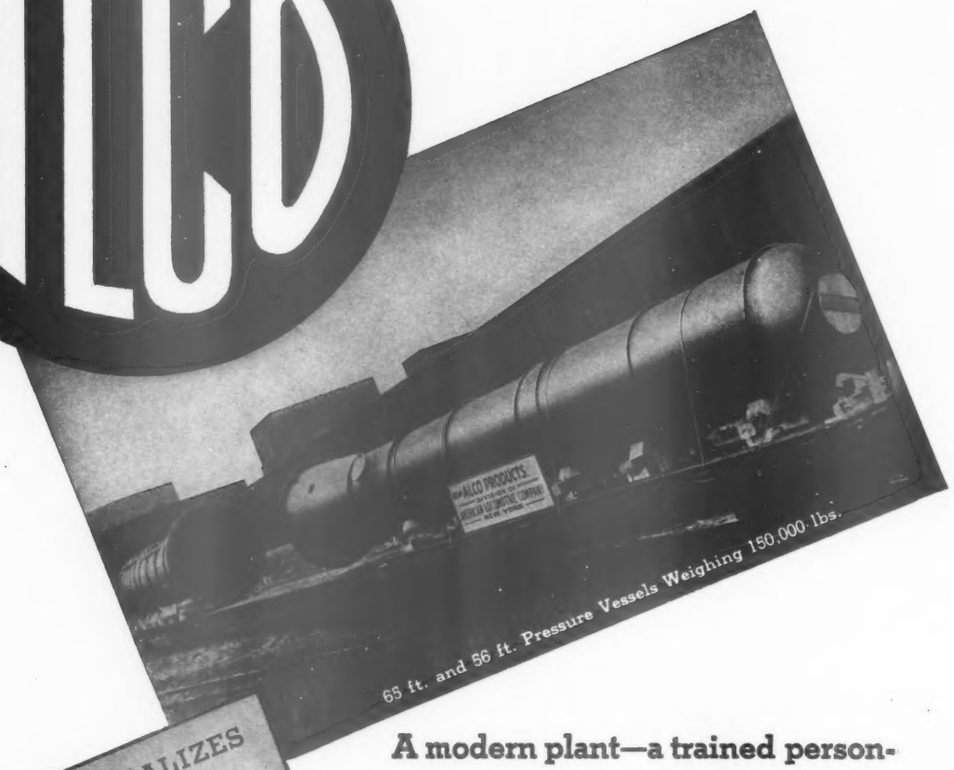
E. B. BADGER & SONS CO.

BOSTON, MASS.

NEW YORK • PHILADELPHIA • SAN FRANCISCO • LONDON • PARIS

*ENGINEERS AND CONTRACTORS FOR PETROLEUM DISTILLATION AND REFINERY EQUIPMENT*

ALCO




ALCO SPECIALIZES
*in*
FRACTIONATING TOWERS
STABILIZER TOWERS
COKING DRUMS
STILLS
PRESSURE TANKS
SCRUBBERS
PRE-FABRICATED PIPING
HEAT EXCHANGERS

**A modern plant—a trained personnel—a century-old tradition of fine workmanship—attractive prices—**

**GOOD REASONS WHY REFINERS BUY ALCO**

**WRITE FOR BULLETINS 1020 AND 1023**

**AMERICAN LOCOMOTIVE COMPANY**
**ALCO PRODUCTS DIVISION**
**30 CHURCH ST., NEW YORK, N. Y.** **DUNKIRK, N. Y.**

"Pete's not bad, eh"

"Aw cats . . . Lane-Wells makes a much faster round trip when they Electrolog"

LANE-WELLS — TECHNICAL OILFIELD SERVICES — EVERYWHERE

GUN PERFORATING • OIL WELL SURVEYS • RADIOACTIVITY WELL LOGGING • PACKERS • LINER HANGERS • BRIDGING PLUGS

# Like stretching your fingers 1000 ft.

## Taylor

**REMOTE PNEUMATIC TRANSMISSION**

***puts the control and measurement of far-away variables at the tips of your fingers . . . on one centralized panel***

REMOTE pneumatic transmission isn't news—because it isn't new—to the petroleum industry. But this Taylor system is causing plenty of talk. It's the first remote pneumatic transmission system to offer all the new performance and design advantages that come from using *standard* Taylor indicating, recording, and controlling instruments. Here are outstanding superiorities:

**Interchangeable Standard Instruments**—Transmitters are standard Fulscope Controllers, readily transferable to other control service. Both transmitters and receivers available with all the new Fulscope's famous "Not 1 but 5" forms of control. Recorders drilled and tapped for easy conversion into controllers.

**Stable, Highly Responsive Measuring Elements**—Transmission system, operating on 15-lb. air pressure range (3 to 18 lbs.), assures more accurate transmission because of greater output pressure change per inch of pointer or pen movement. Bellows elements in both transmitter and receiver are identical standard Taylor low-pressure elements, powerfully constructed and highly uniform in character throughout the small travel utilized. Use of identical bellows permits any receiver to be used for temperature, pressure, flow, or liquid level, by changing chart.

**Greater Convenience**—Operator out on the unit has an indicating or recording instrument for on-the-spot observation.

**Eliminates Electrical Hazards**—Does away with dangers from electrical circuits in explosive atmospheres. Measures, transmits, and receives continuously, regardless of electrical failures.

***SOME SPECIFIC ADVANTAGES:***

▶ Measuring *rate of flow* . . . Cuts out expense of long jacketed lines, long runs of steel pipe . . . Keeps high pressure lines and toxic fluids out of control room . . . Eliminates fire hazards from leaky piping . . . Makes possible, in a single case, a double-duty flow receiver-controller, or a ratio flow receiver-controller.

▶ Measuring *liquid level* . . . With float-operated instruments, inexpensively brings indication or record of liquid level, and a means of adjusting the set point, to the control room . . . with manometer type, does away with long lengths of costly piping.

▶ Measuring *temperature* . . . Greatly extends practical distance between points of measurement and indication, without loss of accuracy . . . Materially reduces installation costs where distances exceed 155 feet . . . Lowers tube system replacement costs.

▶ Measuring *pressure* . . . Eliminates fire and explosion hazards in control room . . . Avoids use of sealing liquids and attendant need for head-pressure corrections . . . Assures uniform high rate of response to pressure changes.

You haven't heard half the story. Send for all of it—now—TODAY—to Taylor Instrument Companies, Rochester, N.Y. Plant also in Toronto, Canada.

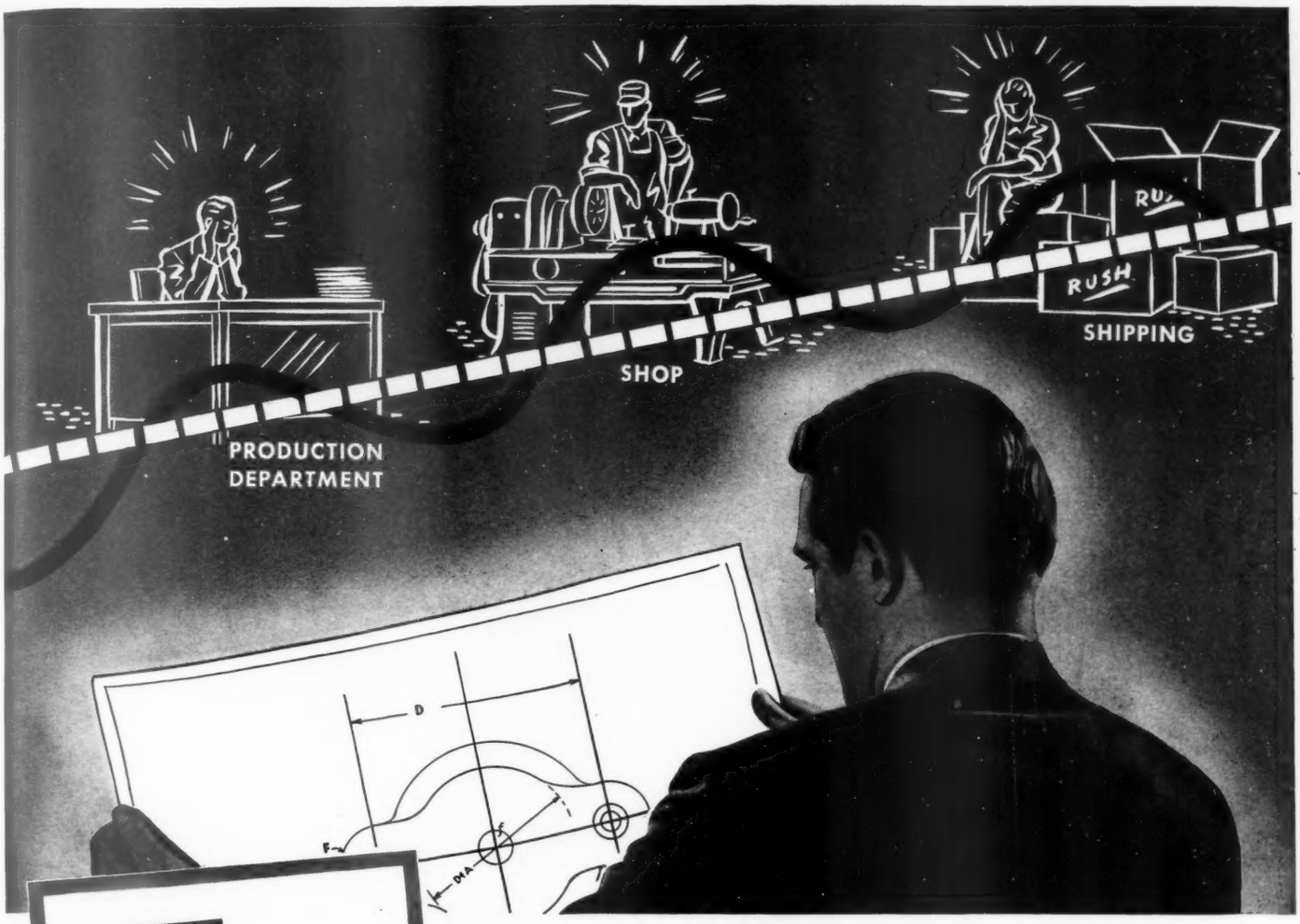
* * *

**In the illustration above, the Taylor Fulscope Indicating Transmitter (left) would actually be several hundred feet away from the Fulscope Recording Receiver-Controller (right) if you stretched out the coiled-up tubing, as it would be stretched out on the job.*

**Taylor**

**Indicating Recording Controlling**

**TEMPERATURE, PRESSURE, FLOW and LEVEL INSTRUMENTS**



## BRUNING "75" PRINTER AND 154 BW DEVELOPING MACHINE

These two machines will provide the high efficiency print production to gear your print department to today's needs. One man can develop 1200 8½ x 11 BW Prints per hour, and two men can develop 2600 8½ x 11 BW Prints per hour.

The Bruning booklet, "New Light On Prints," fully describes the "75" Printer and the Model 154 Developer, and gives information about other Bruning printers and developers. Send for your copy.

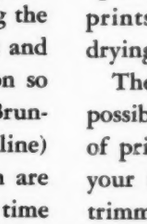
# "We Smoothed Out Our Production 'Humps' With BW Prints!"

● A "jam" in the print department is transmitted all along the line . . . delaying poduction and shipments. That's one reason so many firms are turning to Bruning Black and White (black line) prints . . . the prints which are produced in a fraction of the time and often at lower cost than blue prints.

With BW Prints, you can really cope with today's rush business. These easier-reading prints are produced in TWO simple steps—instead of the *five* time-wasting operations necessary with blue prints. There's no washing or drying to wait for.

The BW Process, too, makes possible the volume production of prints cut to the exact size of your tracings—thus eliminating trimming.

Our free booklet, "New Light on Prints," gives complete facts about BW speed and savings. Mail the coupon for your copy!



**BRUNING** *Since 1897*

SPEEDS—SIMPLIFIES—AND PROTECTS A NATION'S DRAFTING

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St. Louis • Pittsburgh • San Francisco • Seattle

CHARLES BRUNING CO., *Inc.* 1106-200
New York: 100 Reade St. • Chicago: 445 Plymouth Court
Los Angeles: 919 South Maple Avenue
Please send me your new booklet, "New Light On Prints."

*Name*_____

*Address*_____

*City*_____ *State*_____

## AND NOW IT'S "STANDARD" WHERE HIGH CAPACITIES ARE REQUIRED FOR PUMPS IN HAZARDOUS LOCATIONS

**THEIR EXPERIENCE WORKS FOR YOU**

**For more than 50 years, Westinghouse engineers have worked side by side with every branch of the petroleum industry, to develop electrical equipment to meet your specific requirements. Take advantage of this experience and ability on your next electrical problem.**

This Westinghouse explosion-resisting motor for refinery and pipe line service was the first large motor for "Hazardous Locations" to be built without the use of forced ventilation or external cooling equipment. Instead, it employs the long-proved dual ventilated frame originally developed by Westinghouse.

The design met the industry's needs so completely that it has now become "standard"—proved by the purchase of more Westinghouse motors of this type than those of all other manufacturers combined. It is available in ratings up to 1000 hp, 3600 rpm.

More than *electrical* ability was required to design these motors. Our engineers constantly study the petroleum industry and its needs. They appreciate the jobs that motors do—and what breakdowns can cost. So, they build electrical equipment in the light of this practical experience.

That's why it always pays to talk with your local Westinghouse representative when you have an electrical problem. You get "high test" ability that is ready to go to work for you. Try it, for your next electrical need.

WESTINGHOUSE ELECTRIC & MANUFACTURING CO.
EAST PITTSBURGH, PA.

J-94383

# Westinghouse

ELECTRICAL PARTNER OF THE PETROLEUM INDUSTRY

**FREE DRILLERS' WIRE ROPE HAND BOOK**

76 pages of valuable information for superintendents, drillers, engineers, purchasing agents. Write for your copy. No charge. No obligation.

# LOOKING UP!

Up through the steel meshes of this oil derrick—Look! What do you see?

From draw works to crown block, and back again, you see "Flex-Set" Preformed Yellow Strand.

You know that the cable on a rotary rig must be tough—must take it on the chin, and like it. In fact, you know that the only cable that will ever give genuinely **economical** service is the very best cable you can buy.

That is why oil producers are looking up—up toward higher and higher quality. And they are getting it in "Flex-Set" Preformed Yellow Strand.

Preforming the wires and strands of an already excellent cable has produced new properties that no **one** cable of standard type has ever possessed—limpness and flexibility without loss of strength, and remarkable resistance to kinking, drum crushing and fatigue.

Looking up through your rotary rig, and seeing "Flex-Set" Preformed Yellow Strand doing the heavy work, is proof positive that the economy of your operation is also looking up.

**BRODERICK & BASCOM ROPE CO., St. Louis**
**Houston Branch, 1311 Palmer St.**

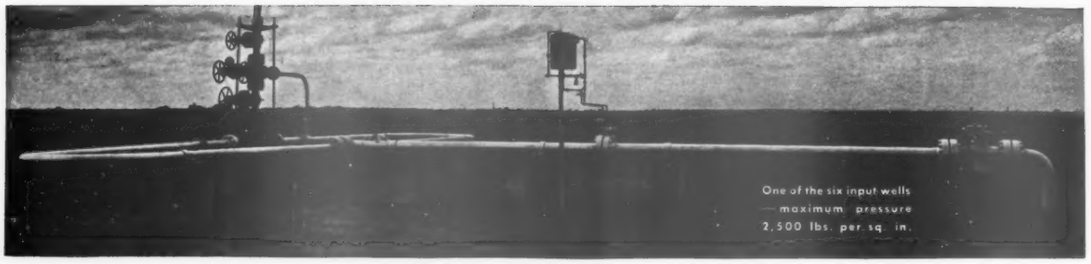
U-16R5

**The Continental Supply Co.**
Mid-Continent Distributors
Adequate Stocks in All Active Fields

**The Republic Supply Co.**
of California
Oil Field Distributors for California

**The McJunkin Supply Co.**
Charleston, West Virginia

# "Flex-Set" Preformed YELLOW STRAND



One of the six input wells — maximum pressure 2,500 lbs. per sq. in.

*A headline-making*

# Repressuring and Recycling Plant

*picks its meters*

● Repressuring and cycling operations require efficiency and adaptability from instruments—the high-pressure, big-volume range calling particularly for extreme ruggedness. Maximum-profit standards, to which all the operations are geared, also demand close and sustained mechanical accuracy.

This is true at the Agua Dulce field with its mammoth high-pressure absorption plant for the recovery of gasoline and distillate. Thirty miles of high-pressure gathering lines feed the Coastal Recycling Corporation plant—having a capacity of 140,000,000 cubic feet of gas daily!

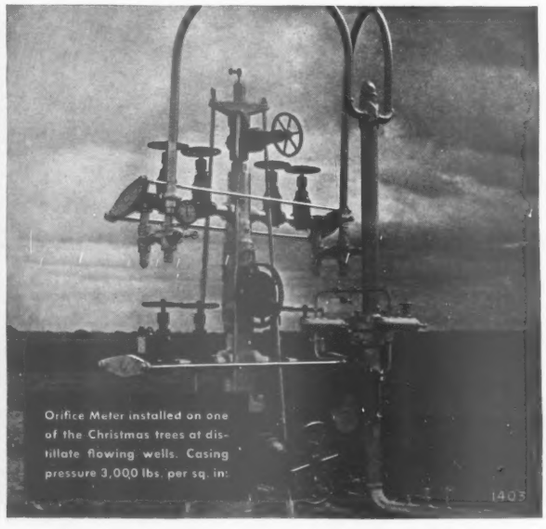
Trustworthy METRIC-AMERICAN Orifice Meters and Flowmeters are installed at the key input wells, the flowing wells, and—in the distillation circuit—on the fractionating stills and absorbers.

METRIC METAL WORKS • ERIE, PA.

**AMERICAN METER COMPANY**

INCORPORATED (ESTABLISHED 1836)

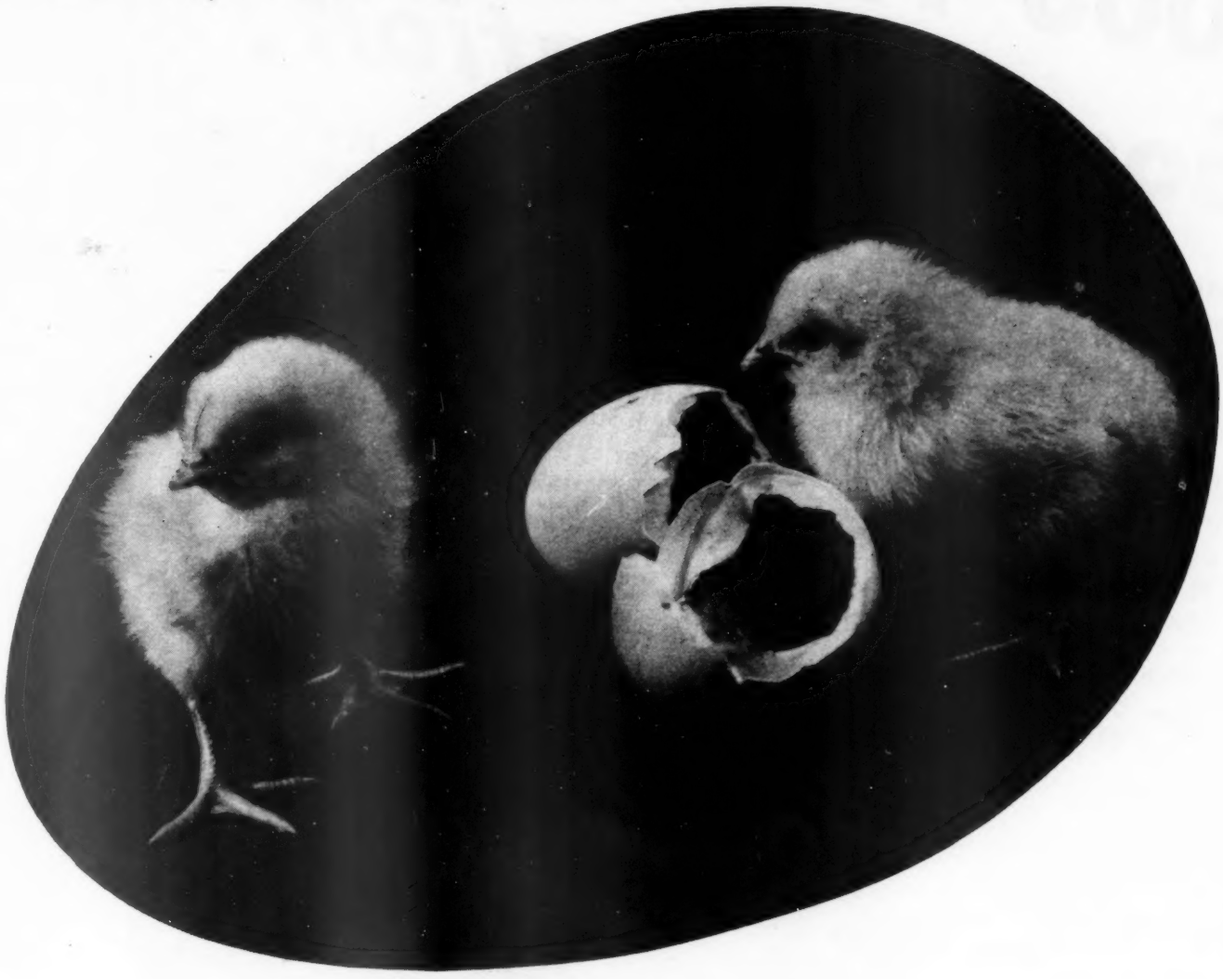
Fractionating stills for producing motor gasoline and kerosene distillate. Flowmeters serving as steam indicators.



Orifice Meter installed on one of the Christmas trees at distillate flowing wells. Casing pressure 3,000 lbs. per sq. in.

1403

# NOW, *You can REALLY Count 'em*



## . . . *before they are Hatched.*

A GROWING NUMBER of conservative petroleum technologists are using Core Laboratories, Inc. to furnish *at the well* detailed reports of all cores taken. Results of this service give a reliable picture of production possibilities *before* any pipe is run and any testing done . . . often saving considerable expense. Then when testing is done, the operator is assured of optimum results.

**CORE Laboratories, Inc.**

*Complete Laboratory Analysis at the Well*

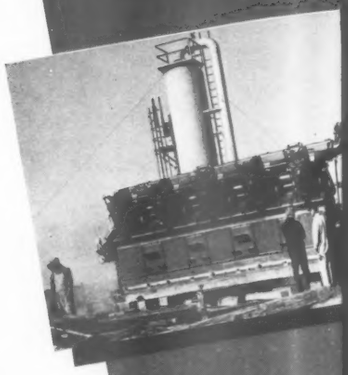
**GENERAL OFFICES - SANTA FE BLDG., DALLAS**

BASE POINTS LOCATED IN THE FOLLOWING CITIES:

TEXAS: HOUSTON, CORPUS CHRISTI, WICHITA FALLS ● LOUISIANA: COTTON VALLEY, LAKE CHARLES, LAFAYETTE ● OKLAHOMA: OKLAHOMA CITY ● ILLINOIS: CENTRALIA ● CALIFORNIA: BAKERSFIELD, LOS ANGELES

▼ WRITE FOR Bulletin "A" which gives the interesting story of our portable laboratories and services available thruout the United States.

# 1,000 Horsepower Goes "on Location"!

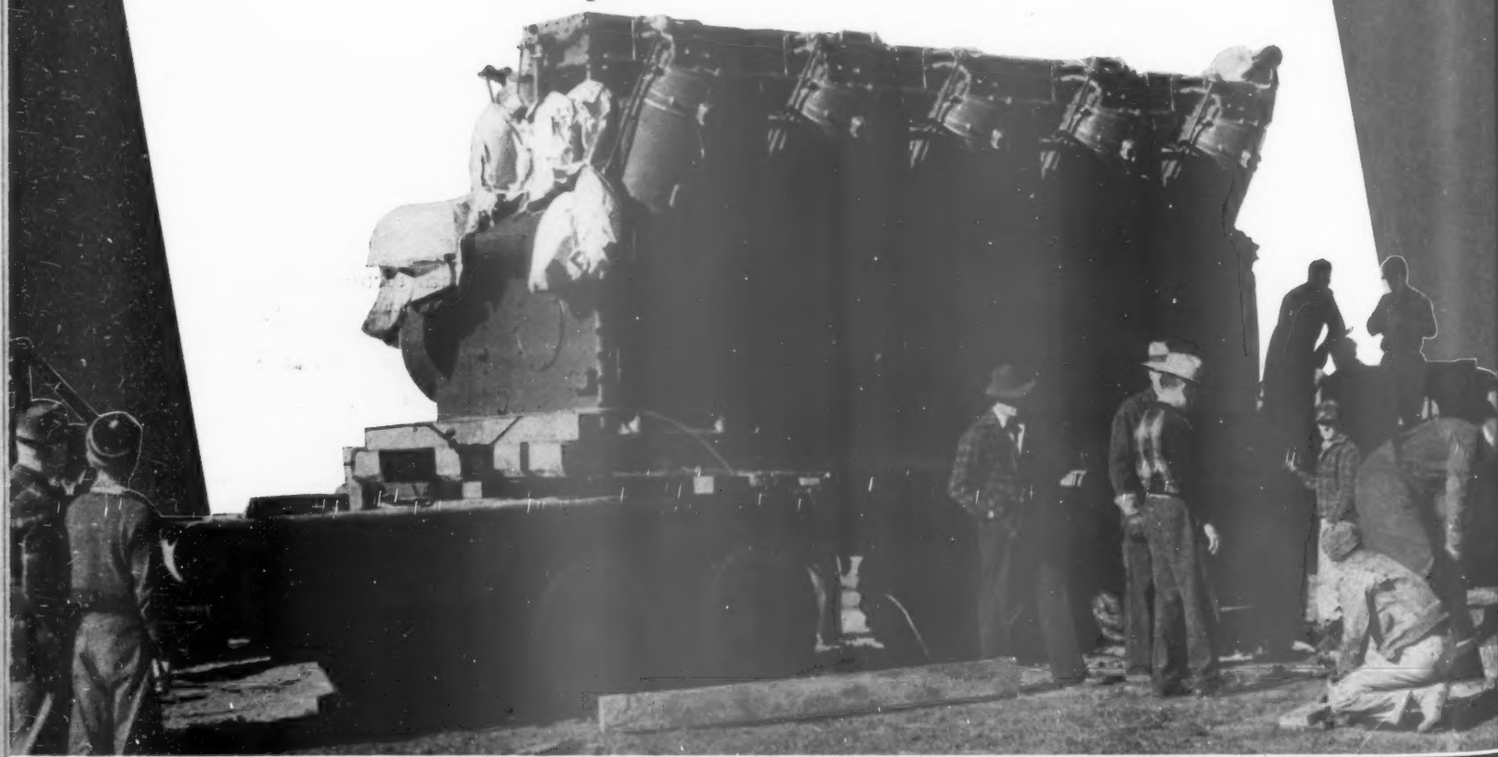


Here's graphic proof of the transportability of Type G-MV Compressors . . . a ten-cylinder unit, packing 1,000 rugged horsepower, being trucked to location . . . and what's more, completely assembled except for attaching compressor cylinders and flywheel!

This compactness means more than just easy transportation . . . it means that Type G-MV's will cut housing and foundation costs from 25 to 50 percent under other types of compressors! It also means that Type G-MV's can be installed and "on the line" in less time!

There are more reasons for the many Type G-MV's now serving the petroleum industry . . . Bulletin 332 will give you details . . . Write for it!

A ten-cylinder Type G-MV gas-engine-driven compressor "on location" for Cities Service Gas Company. This 1,000-hp unit is now moving gas from Pampa fields to Kansas markets.



## THE COOPER-BESSEMER CORPORATION

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Box 454, Greggton, Texas
1501 Arcade Building, St. Louis, Missouri
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529 M & M Building, Houston, Texas

## *Highest octane at lowest cost*

Forty-nine refiners in the United States and Canada using the U. O. P. catalytic polymerization process in 1940 produced 130 million gallons of 81-83 octane gasoline from gas that formerly went for fuel

The cost of operating the process was as low as the cost of the raw material

And you know the price you can get for 81-83 octane gasoline

This polymer gasoline was made from the olefins in the gas produced in cracking operations, leaving the stripped gas for use as fuel

These refiners—and others—will produce still more U. O. P. poly gasoline in 1941

Are you one of them?

You ought to be

Universal Oil Products Co
Chicago, Illinois

Dubbs Cracking Process
Owner and Licensor

ALTER EGO: Literally "one's other self"—the still, small voice that questions, inspires and corrects our conscious action.

**ALTER EGO:** What this new welder does for us should make you want to light a match under all the antiques we're operating and standardize on Lincoln.

*The others seem to be satisfactory. Let's match performances—Lincoln versus—*

**ALTER EGO:** Matching performances is right where the Lincoln shines! It is the *only* welder with Dual Continuous Control—in other words, with a Current Control PLUS a Job Selector—BOTH *continuous* in selection and *self-indicating*.

*So what?*

**ALTER EGO:** Then there can be no matching because that one advantage gives us unmatchable ease of control, unmatchable range of application and unmatchable arc stability.

*All right, suppose my job is an overhead fillet weld. Then what?*

**ALTER EGO:** Just set the Job Selector for "Overhead" and set the Current Control for any amperage to suit the size of plate and electrode. Then you're set for faster welding, less spatter and a stronger weld. Likewise for ALL types and sizes of work . . . in all positions. So if we make the shop 100% Lincoln, we get those benefits 100%. Can we afford less than 100%?

*And what would appeal to me would be to pin undivided responsibility on Lincoln for tops in welding performance.*

• •

LINCOLN SUGGESTS: We are able, willing and eager to assume undivided responsibility to assure you tops in welding performance. Lincoln users get just that. 31 reasons for Lincoln's unmatchable performance are discussed in Bulletin 412, Pages 12-16—gladly mailed you on request.

Copyright 1941, The Lincoln Electric Co.

LINCOLN "SHIELD-ARC" WELDING

THE LINCOLN ELECTRIC COMPANY
Cleveland, Ohio

Largest Manufacturers of Arc Welding Equipment in the World

OIL and GAS JOURNAL EDITION

# BAASH ROSS News

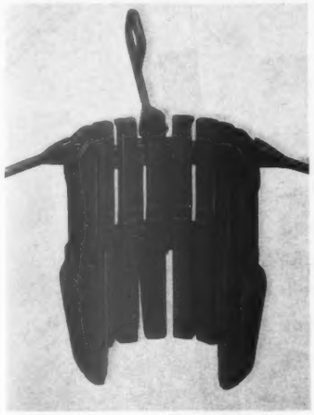
BAASH-ROSS TOOL COMPANY • LOS ANGELES • HOUSTON • NEW YORK

A BULLETIN COVERING NEWS OF EQUIPMENT AND OPERATIONS IN THE PETROLEUM INDUSTRY

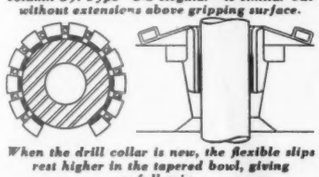
# THE NEWEST SAFETY DEVELOPMENTS TO PREVENT COSTLY FISHING JOBS

## New Type Slips Wrap Around Pipe Automatically Compensate For Wear

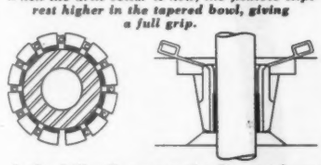
Even the most seasoned oil men have been known to tremble in a cold sweat when confronted with the problem of supporting a string of streamlined drill collars in the rotary table while making-up or breaking them out of a drill string. The trouble with conventional slips is that, as the drill collars wear from the abrasive action against the wall of the hole, the slip segments are unable to compensate for the reduced diameter of the collars. As the diameter diminishes, less and less slip area is in contact with the collar until finally the slips fail to hold and the string drops down the hole.



**NEW! BAASH-ROSS DRILL COLLAR SLIPS**—*Illustrated is the type "C-S Long" with extensions to provide a seat for Safety Clamp (see column 3). Type "C-S Regular" is similar but without extensions above gripping surface.*



*When the drill collar is new, the flexible slips rest higher in the tapered bowl, giving a full grip.*



*As the drill collar wears, the slips rest lower in the bowl—but always giving the same full grip!*

**ORDINARY SLIPS**

*With new collars give adequate grip.* *As collar wears give less and less grip.*

Baash-Ross tackled the problem and finally worked out a special drill collar slip that works like a charm. The slip segments are narrow and mounted together in a flexible link arrangement that permits them to wrap around the collar like a chain tong. As the drill collar wears and its diameter becomes smaller, the Baash-Ross Drill Collar Slip automatically adjusts itself so as to give the same full slip contact as when the drill collar was new. In fact, as much as 1½" change in the *diameter* of the pipe (almost 5" circumferential measurement) will not affect the gripping efficiency of this new Baash-Ross tool!

***Just Off the Press*—Send for your copy of Bulletin 13C fully describing this newest safety development!**

Baash-Ross Drill Collar Slips are available in two types—"Regular" and "Long." The "Long" type is especially designed for use with the Baash-Ross Safety Clamp to insure *double* safety under all conditions. This type has an extension above the slip segments to provide a seat for the Safety Clamp. Both the "Regular" and "Long" types have renewable liners to insure maximum operating efficiency at all times with minimum maintenance costs.

A set of Baash-Ross Drill Collar Slips together with a Baash-Ross Safety Clamp is one of the best safety investments you can make to protect your well against costly fishing operations . . . *and it's an investment that will last for years.* Your nearest Baash-Ross representative will be glad to give full information!

### HERE'S ONE FOR THE BOOKS

*Alta Loma Field, Texas Gulf Coast:* When a well went wild here and could not be controlled, the operator put down a directionally-drilled hole a short distance off. This well drilled into the discovery well at 8450 feet, diverting the flow while pipe stuck in the wild well was cut and pulled, casing run, and the wild well completed for a producer. Then the directional hole was plugged back, straightened, and drilled to the pay for a *second* normal producer.

This must establish *some* kind of a record for making the most of a situation!

## A MULTI-GRIP SAFETY CLAMP FOR FLUSH JOINT EQUIPMENT

Here's a new tool that no drilling rig should be without—*the Baash-Ross Safety Clamp.* It's a tool that enables you to handle flush joint pipe, streamlined drill collars and similar flush-surfaced equipment with complete safety at all times. It wraps around the pipe in a jiffy and only a few quick turns of a socket wrench are required to fasten it firmly in place.

Once applied, it will hold the heaviest loads without slipping, because each individual link has a *separate* gripping member that automatically adjusts itself to the load. These gripping members are in reality small tapered slips dovetailed into the link bodies. When the clamp is tightened these slips take a firm initial grip on the pipe. As the load increases—or should a sudden impact loading occur—the tapered slips wedge themselves even tighter against the surface of the pipe, forming a grip that will not fail. Yet the instant the clamp is loosened with the socket wrench, the slips release their bulldog grip so that the clamp can be readily removed.

It is important to note that the clamp, being flexible, takes a solid grip on *any* pipe surface, whether it's out-of-round or not. And because it grips uniformly *at all points,* it will not crush thin-walled pipe under heavy loads. Links can be quickly added or removed on the rig so that the clamp can be made to fit any size pipe from 3¾" diameter up to as large as desired. A neat steel case is provided for storing the extra links—as well as the clamp and wrench—when they're not in use.

**Your copy of Baash-Ross Bulletin No. 6-C, telling all about this inexpensive Clamp is ready. Why not send for it *now?***

#### CAN BE USED WITH DRILL COLLAR SLIPS

The use of this clamp with the Baash-Ross Drill Collar Slips described at left gives *double* protection against dropping drill collars through the rotary table, no matter how worn or out of round they may be.

Also, when need for an elevator shoulder arises this clamp is ideal. On a recent fishing job, for example, it lifted a string of *approximately 4000 feet* of 4½" drill pipe plus *five* 7¾" drill collars when used for this purpose.

**DRILLING CHAINS** should always be kept well lubricated. Dryness causes chain bearings to freeze under heavy loads. This in turn prevents free flexing, causing the chain to miss the proper sprocket seat. The resulting impact load leads directly to chain breakage.

**BAASH-ROSS**

***INSURANCE RECORDS SHOW** that many serious boiler accidents are caused by using fine-threaded valves on the gauge glass. When the gauge glass breaks, the operator often is seriously burned while trying to close the valve. The remedy—use valves that can be closed quickly with one turn or less. Check your boilers and make sure they have this safeguard.*

**BAASH-ROSS**

***SPEAKING OF SAFETY** reminds us—Did you know that Baash-Ross makes a Safety Joint for use in the fishing string that can be turned in an unscrewing direction—(in addition to the normal direction) without loosening until the operator wants it to? It's ideal for fishing work where tools are used that must be rotated backwards to operate. Another thing—it's available made of drillable metal, if desired, for complete well safety. Its name? The Baash-Ross "Autolock" Safety Joint!*

**BAASH-ROSS**

**WRESTLING WITH HEAVY DRUMS** of engine oil, resting either on make-shift racks or none at all, is an ever-present source of injury. One operator built a special rack holding six rectangular 55-gallon tanks (the type used in service stations) equipped with visible measuring pumps. Result—increased safety, greater convenience.

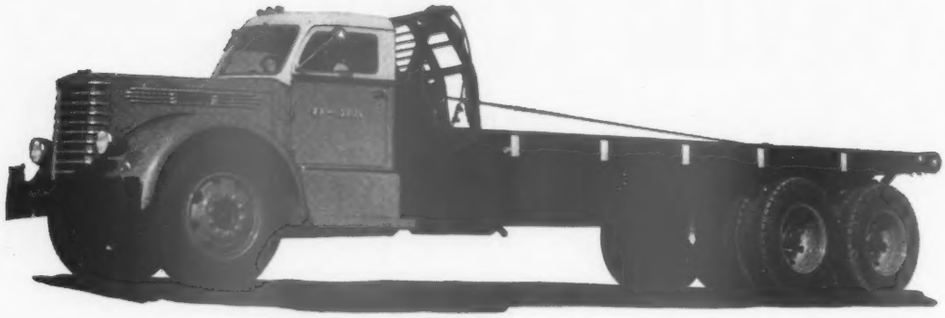
**BAASH-ROSS**

***A RECENT SURVEY** of fatal drilling and production accidents in one district discloses that an even 50% were caused by workmen being struck by falling equipment . . . another 21% by the workmen themselves falling from the derrick . . . and the rest by miscellaneous causes.*

**BAASH-ROSS**

**71% OF THE FATAL ACCIDENTS being caused by either equipment or workmen falling is something to think about. For a long life, keep yourself out from under anything being lifted . . . keep your eyes alert for dropping objects . . . keep your hard hat and safety shoes on at all times around the rig . . . and always remember to fasten your safety belt when working in the derrick!**

# *Before you buy new equipment*



## MEASURE THE MERIT OF "6-WHEELERS"

• This "6-Wheeler" — a husky machinery truck — can take it! For moving oil field equipment and fragile as well as heavy loads, on or off paved highways, a rugged, safe and smooth-riding "6-Wheeler" can't be beat. Have you investigated the new trucks with integrally engineered Timken 6-Wheel Tandem Axle Units? Measure their merit!

Factory-installed · Undivided responsibility · Weight better distributed for bigger loads · Longer tire and brake life · Smoother riding · "Hug" the road · Better traction off-road · Greater safety · Sizes and types with final drive ratios to "fit the job" and bring out the best in the truck.

Before you buy new equipment, measure the merit of "6-Wheelers." They're tops.

THE TIMKEN-DETROIT AXLE CO., DETROIT, MICHIGAN
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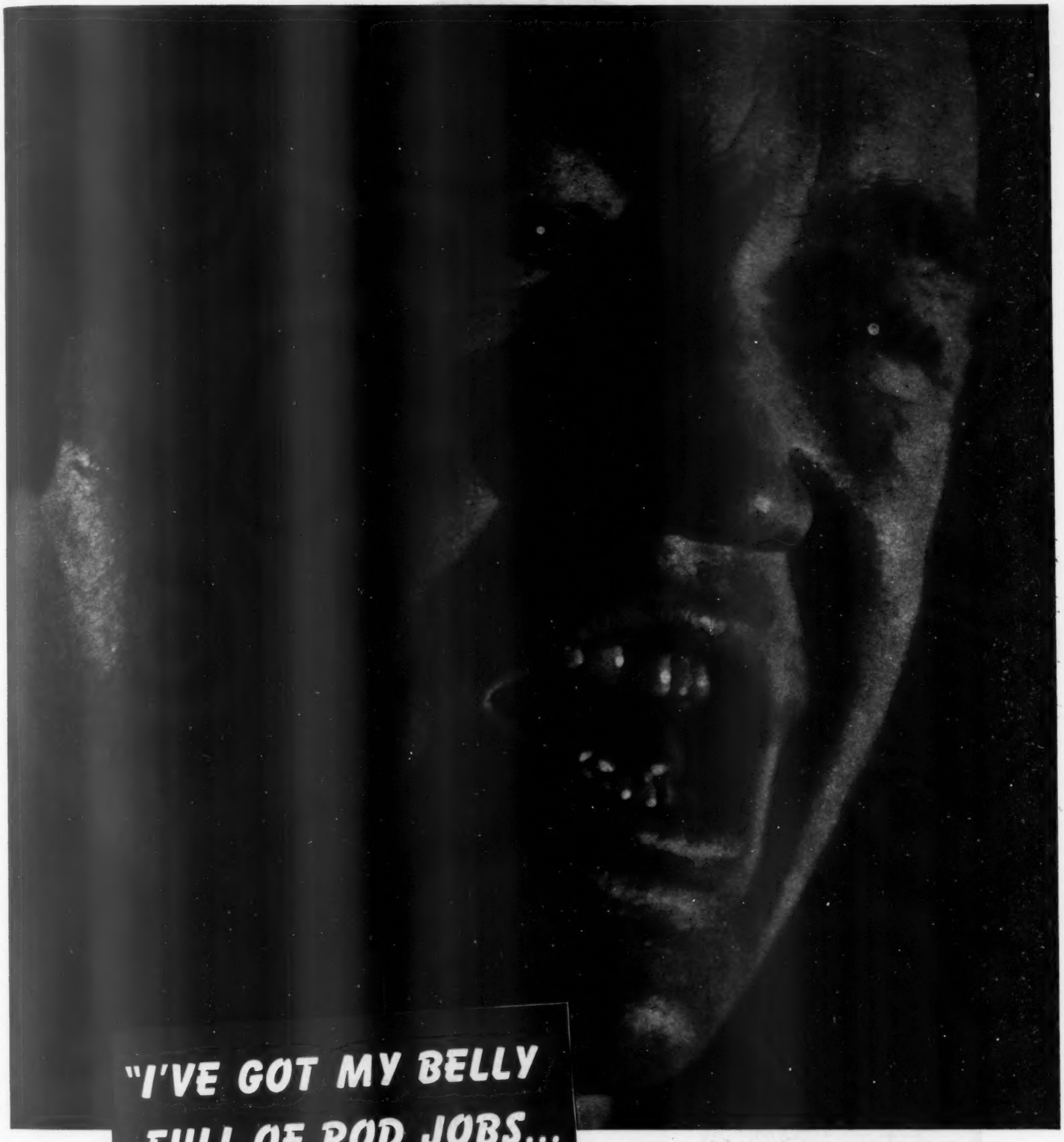
**when you buy, specify**

# TIMKEN

**FACTORY-INSTALLED TANDEM AXLE UNITS**



# "I'VE GOT MY BELLY FULL OF ROD JOBS..."

I first saw the light of day in Missouri, and the symbol of the Democratic Party was never any more stubborn or bull-necked. I know when I'm licked, though. And when it comes to running sucker rods, I'm just not interested unless they're Axelsons.

For thirteen years I been runnin' a rod crew I've rolled out of bed at all hours of the night in good weather and bad to do a fishin' job on a string of rods that busted. About three years ago I suddenly realized that I done this kind of stuff less, or not at all, when Axelsons were in the hole.

Since that time I been gettin' my sleep regular and I've had two salary jumps just because the head office thinks I know how to baby a pumpin' well. I'm no better or no worse than the next gang pusher when it comes to runnin' rods or pumps, but I've learned that it pays dividends to me and my boss to buy Axelson quality equipment for the long run. . . Axelson Manufacturing Company • Los Angeles, Calif. • St. Louis, Mo. • New York City

# Don't Forget Croloy 7

SEAMLESS Security

B&W Quality

| Nominal Percentage Analysis | |
|---|---|
| Carbon | 0.15 Max. |
| Manganese | 0.50 Max. |
| Sulphur | 0.030 Max. |
| Phosphorus | 0.030 Max. |
| Silicon | 0.50–1.00 |
| Chromium | 6.00–8.00 |
| Molybdenum | 0.45–0.65 |

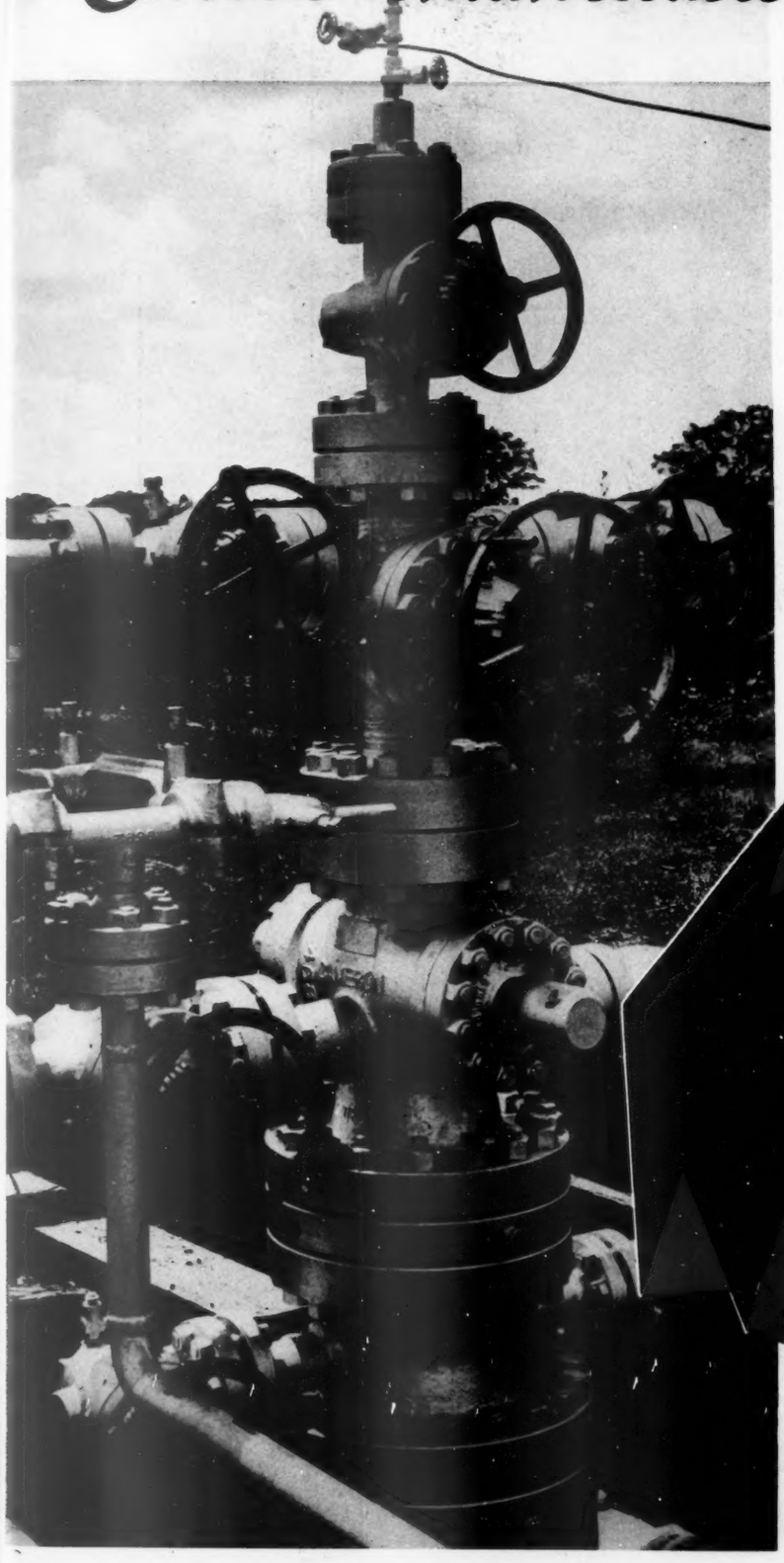
- Outstanding Intermediate Alloy
- 40% More Chrome Than Croloy 5
- Considerably increased corrosion resistance over Croloy 5
- Good oxidation resistance
- Increasing popularity—in most major refineries
- Examine economics—ask for Technical Bulletins
- Get facts—A. P. I. Corrosion Test Strips supplied

## BABCOCK & WILCOX TUBES

HOT FINISHED COLD DRAWN ALLOY STEELS CARBON STEELS

THE BABCOCK & WILCOX TUBE COMPANY, BEAVER FALLS, PA.

# *Safer Completions Today.... Easier Maintenance Tomorrow!*



## CAMERON TYPE "LD" RAM TYPE TUBING CONTROL HEAD SERVES FOURFOLD PURPOSE, YET COSTS LITTLE, IF ANY, MORE THAN CONVENTIONAL "SET SCREW" TYPE TUBING HEADS

The Cameron Type "LD" Ram Type Tubing Control Head presents an unparalleled achievement in the field of completion equipment.

**It provides the ultimate in safe, dependable control during every step of completion operations.** The full opening vertical bore freely passes drilling-in tools, liner and screen, and packers. Its rams, provided with patented Cameron Self-Feeding Packing Elements, assure positive blowout protection while tubing is being run, well washed, packer collapsed, tubing suspended, etc. In fact, the highest pressure wells may, with absolute safety, be washed completely clean with water or oil before hanging the tubing.

**It provides four proven methods of suspending and sealing the tubing string: (1)** Ram suspension on a hanger nipple as illustrated in the cross-section drawing below; (2) Slip suspension in the top flange of the head, utilizing the rams as a master gate below the outlets to seal the annular space between tubing and oil string; (3) Boll-weevil suspension from the top flange of the head; (4) Suspension from a threaded hanger flange which bolts down on top of the head.

**It is extremely practical on any reworking subsequent to the original completion of the well.** When used in conjunction with a second Cameron, ram type control unit, tubing may be raised or lowered, or pulled from the well under pressure without killing.

**It obviates the need for a cement retainer when making a squeeze job.**

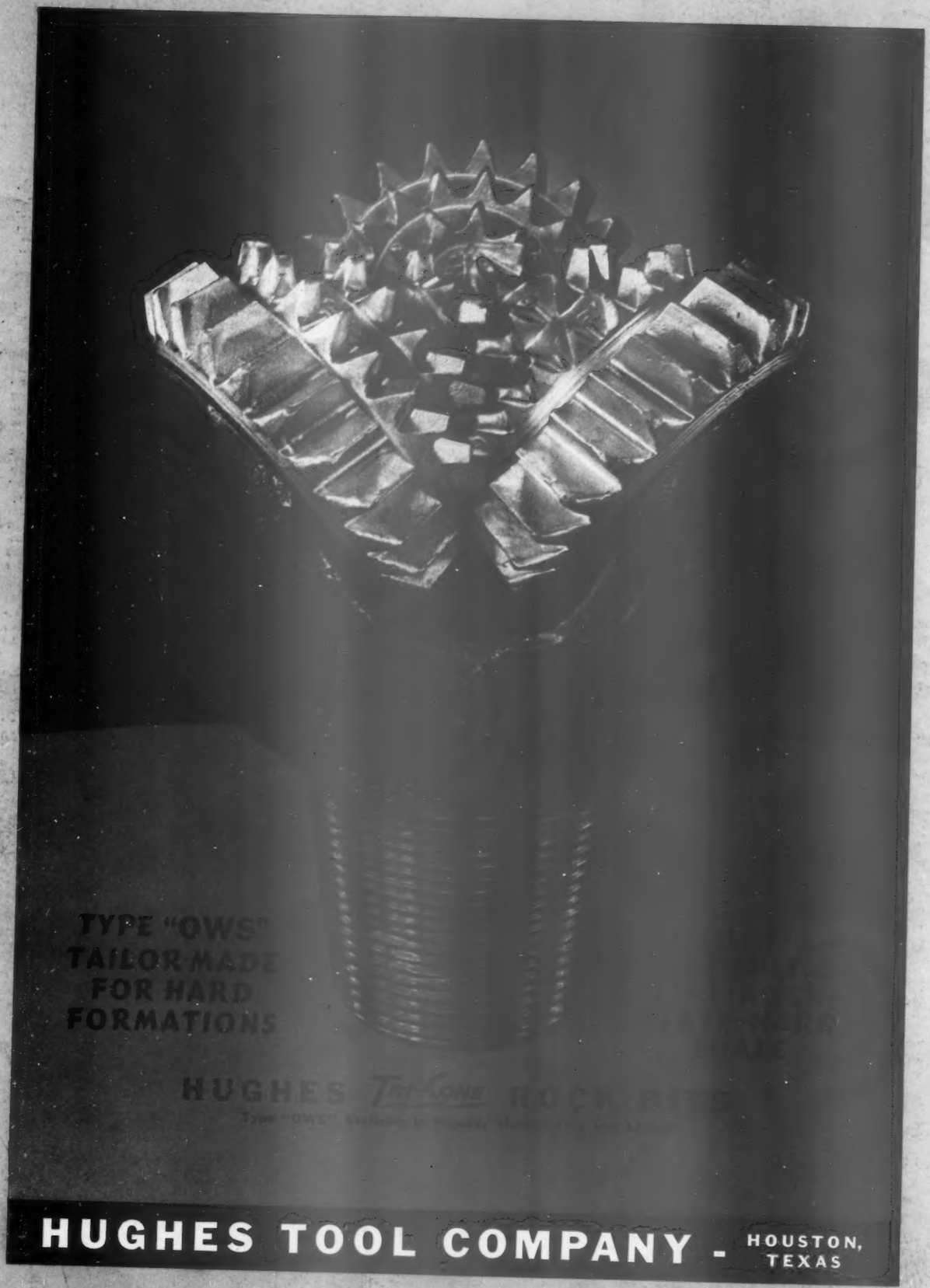
**CAMERON IRON WORKS, Inc.**

**711 MILBY STREET HOUSTON, TEXAS**

***Export:* 74 Trinity Place, New York, N. Y.**

***California Distributor:* The Howard Supply Co., Los Angeles**

***Oklahoma Representative:* Paul Edkin, Tulsa**




HUGHES TOOL COMPANY - HOUSTON, TEXAS